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WILD ORCHIDS OF ILLINOIS

Glen S. Winterringer

Illinois State Museum

Frontispiece: *Cypripedium parviflorum.*

Photo by John Gerard

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Otto Kerner, Governor
DEPARTMENT OF REGISTRATION AND EDUCATION
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ILLINOIS STATE MUSEUM
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POPULAR SCIENCE SERIES, Vol. VII

WILD ORCHIDS OF ILLINOIS

Glen S. Winterringer
Curator of Botany

Printed by Authority of the State of Illinois
1967

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IN MEMORIAM

This volume is dedicated to

Arthur Gibson Vestal

1884 - 1964

Professor of Botany, University of Illinois.
Through years of service a teacher, advisor and friend.

and to

Virginius Heber Chase

1876-1966

Resident of Peoria Heights, Illinois.
Collector of plants, naturalist and friend.

A thing of beauty is a joy forever:
Its loveliness increases; it will never
Pass into nothingness; but still will keep
A bower quiet for us, and a sleep
Full of sweet dreams, and health, and quiet breathing.

JOHN KEATS, *Endymion, Book I.*

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INTRODUCTION

The purpose of this booklet is to supply some information about the wild orchids found in Illinois. In this State there are thirty-five species or kinds of wild orchids distributed through fifteen genera or related groups (see table, page 7). Some of these species are found only in the northern area, some only in the southern area, and others are statewide in distribution. All of them are illustrated in this booklet. Scientific names, common names, distribution in Illinois, habitats, flowering periods, predominant colors of flowers, and descriptions of the plants are also given. Natural hybrids known from Illinois are listed in the text in suitable places. Many technical terms are defined in the text or in the glossary and a list of references is included for those interested in further study. Simplified keys, if used with pertinent illustrations, should aid in identification. The classification and names used are essentially those of G. Neville Jones in the FLORA OF ILLINOIS, Third Edition, 1963. Recent changes in nomenclature are known. Those who wish to investigate these changes should consult the special literature involved.

EPIPHYTES, SAPROPHYTES AND PARASITES

Orchids are found over the entire earth in suitable places where their growth requirements are met. The greatest concentration of species and numbers is in Central America, South America and in Southeast Asia. Most of these showy, tropical orchids are epiphytes, that is, they grow on a support other than the soil surface. The plants are found on tree branches, logs, in crotches or in crevices in the bark.

Epiphytes, while maintaining their independence as growing plants, are attached by roots, but the latter act mainly as holdfasts. Part of their nutrition is obtained from decaying organic material in which the roots may be embedded but growth materials are not extracted from the objects to which the plants are attached; these plants are not parasitic. Roots of epiphytes are adapted for absorption of moisture from rain or very humid air. Temperature, rain, humidity, light and decaying vegetation from other plants furnish a "natural greenhouse" for growth of the tropical orchids. In a man-made greenhouse they are often grown in porous pots or baskets filled with shredded fir bark or Osmunda fiber and "fed" with fertilizers. However this is merely another facet of the artificial environment required for growth of these plants; they are still epiphytes.

In contrast, terrestrial orchids grow in or on the soil surface, and Illinois orchids belong to this group. Saprophytes are plants which secure most of their growth requirements from moist, decaying organic material in soil. Some of our Illinois orchids are

saprophytes whose roots are intimately associated with certain soil fungi. This association of fungi and roots of plants results in a symbiotic union known as mycorrhiza. The union produces a state or condition that benefits both the fungus, the plant roots and ultimately the entire orchid plant. The growth balance established between orchid root and soil fungus makes it possible for the fungus to survive and for the orchid to grow, produce flowers and finally seeds. Some saprophytic or partially saprophytic plants of Illinois are not orchids, for example: Indian pipe and Pinesap which belong in the Heath Family. Mushrooms are other common examples of saprophytes but they are not flowering plants; they reproduce by developing spores and have neither flowers nor seeds.

A parasite, plant or animal, takes most or all of its growth material from other living things. Parasitic plants grow both on and in a host plant. Modified roots, called haustoria, which are sucker-like structures, penetrate the cellular tissues of the host plant and extract nutrients for the parasite's growth at the expense of the host. Some of our Illinois orchids may be partial parasites but this has not been established by observation and through experiments. Resolution of this question would be an interesting field for investigation by qualified students. Some parasitic plants of Illinois are not orchids, for example: Dodder, Mistletoe, Beechdrops, Squaw-root, and Broomrape.

MONOCOTS AND DICOTS

Flowering and seed-producing plants are classified, on the basis of flowers, seeds, leaves and general anatomy, into two very large groups: Monocotyledons or Monocots, and Dicotyledons or Dicots. Orchids are monocots as are iris, lilies, amaryllis, sedges and grasses including corn, and others. Many garden and field plants are dicots, such as sunflowers, geraniums, petunias, beans, and others. It is not difficult to learn to separate plants into one of these two groups. Leaf veins of a monocot are parallel with the edge of the leaf and with a mid-vein extending the length of the leaf blade. Leaf veins of a dicot are not parallel but branched and forked forming a network. The flower parts of monocots — sepals, petals, etc., — are generally in three or multiples and those of dicots are in fives or multiples.

COMPARISON OF TRILLIUM AND ORCHID FLOWERS

All orchids are classified in the Plant Kingdom in the Orchid Family or Orchidaceae. Some authors and taxonomists believe that world-wide there are as many as 15,000 species known today. It is useless to give any figure as final, for all wild orchids have certainly not been discovered. In the remote areas of densely forested

Amazonia, Earth's largest jungle, many species may yet remain undiscovered by man. In addition, natural hybrids are known to occur and many new orchids are produced through artificial hybridization by orchid specialists.

Examine a common, spring-flowering Trillium or Wake-robin (Lily Family), or a picture of one, and you will see that the flower parts are easily distinguished. There are three outer green sepals and three inner colored petals. Three stigmas in the center receive pollen, and six yellow anthers are the pollen producers. Below all of these flower parts are three green leaves. An orchid flower is neither quite as simple nor as easily analyzed as a Trillium flower. It takes careful observation to relate sepals, petals, anthers and stigma to similar parts in a Trillium flower. Orchids, some particularly more than others, appear strange, exotic and beautiful because some parts of their flowers may be greatly modified in size, shape, color and position. The modified parts in the orchid flower may not appear just as you would expect, but sepals, petals, stamen(s), and stigma are indeed present. The drawing, page 8, shows how a Trillium and an orchid flower have similar floral parts.

Diagrams, however, will not explain the entire story. An orchid's sepals are generally of a color other than green, and they may be partially fused or united. Sometimes the dorsal sepal, at the top, is unlike the lateral sepals, at the sides, in shape and size. Of the three petals, two are generally alike but the third may be very unlike the other two. The extreme variability of this third petal in all the different species of orchids makes it rather special. We call this highly variable third petal the lip or labellum. It may be flat, lobed, sac-like, fringed, notched and further modified at its base to form a short or long spur. It is ordinarily the upper petal before the flower bud is open. In the mature flower the lip assumes its lower position because of the twisting of the flower stalk or pedicel. The ovary, to which petals and sepals are attached, may be twisted also. The style, stigma and stamen(s) are joined or united into a "column" that is itself often colorful and resembles extra petals. There are no separate stamens and pistils as you observed in the Trillium, page 8. These two modifications, lip and column, distinguish an orchid flower from all others. Thus they are the distinguishing features of all flowering plants called orchids.

POLLEN AND SEEDS

Pollen produced by orchids is distinctive; it may be fine and powdery, grain-like, waxy, or may occur in masses called pollinia. An authoritative discussion on pollen is included in NATIVE ORCHIDS OF NORTH AMERICA by Donovan S. Correll whose excellent illustrated book also includes descriptions of additional orchid features. The wonderful book by Charles Darwin, written

90 years ago, with the title, VARIOUS CONTRIVANCES BY WHICH ORCHIDS ARE FERTILIZED BY INSECTS, will be worth any time spent in examining it.

Seeds of orchids are enclosed in structures called capsules. The seeds are among the smallest known — their dimensions are measured in microns, a millionth part of a meter. A detailed account of orchid culture, history, seeds, anatomy, physiology, hybridization, diseases, etc., is available in THE ORCHIDS, A SCIENTIFIC SURVEY, edited by Carl L. Withner.

COMMERCIAL VALUE

For the reader's information the orchid *Vanilla planifolia* should be mentioned briefly. The vanilla of commerce was originally derived from this orchid which grows in southern Florida, West Indies, and in Central and South America. A more complete story is contained in the account by Donovan S. Correll: *Vanilla: Its History, Cultivation and Importance* and *Vanilla — The Orchid of Commerce* in THE ORCHIDS, A SCIENTIFIC SURVEY. Since chemical processes can create artificial vanilla flavor and fragrance, this orchid is hardly an item of great commercial importance now. Exotic orchids, grown commercially as flowers of the florist trade, are very important and represent investments of millions of dollars.

HISTORICAL AND LEGAL ASPECTS

Historical accounts of orchids and the Orchid Family have not been repeated in this publication. In the list of references the interested reader will find many additional titles. We can say briefly that the earliest records of orchids take us back in time to years before the Birth of Christ and that Asian people were probably the first to cultivate and study them centuries ago. Orchids were certainly part of man's knowledge before North America had been discovered. The area, now the State of Illinois, was a land of prairies and forests untouched by explorers and travelers. This vast land, unaltered by man and subject only to the cycle of seasons, must have furnished many suitable habitats for wild orchids. Today we need to protect some wild flowers and to discourage those people who would eliminate them from the few remaining places in which they grow. Thus, in the text, no exact localities for Illinois orchids have been given.

ORCHIDS ARE DELICATELY ADJUSTED PLANTS AND ANY ORDINARY ATTEMPTS TO TRANSPLANT THEM WILL MEET WITH VERY LITTLE SUCCESS. Let them grow in their natural laboratory. Many wild flowers, including

orchids, are protected by law in Illinois: Chapter 38, ILLINOIS REVISED STATUTES, 1939. "An Act for the conservation of certain wild plants," 579a (Sale), and 579b (Limitation), regarding prosecution.

Acquiring knowledge about a few of our little known wild flowers can be a source of pleasure. During the past twenty years the author has often heard comments from citizens of Illinois indicating that they were completely unaware of and uninformed about the existence of wild orchids in our State. Such comments were probably the original inspiration for the preparation of this booklet.

ORCHID HUNTING AND GROWING

If you go orchid hunting, do it with book and camera. Enjoy the satisfaction of finding, identifying and sharing the beauty of these unusual wild flowers and avoid breaking laws. We must explain that orchids are collected in Illinois by professional botanists and authorized collectors who have permission to take plants intended as permanent records in herbaria. Such plants are used in study and for reference. You may see pressed, dried, mounted and identified orchid specimens from Illinois in some herbaria, to mention a few, the Illinois State Museum, Springfield; University of Illinois, Urbana; Illinois Natural History Survey, Urbana; and Southern Illinois University, Carbondale.

If you wish to cultivate orchids, try some of the more dependable tropical species and their hybrids. They can be successfully handled, without great cost, in the home or in a small greenhouse. All of this will take careful planning and the amateur orchid grower can consult builders of greenhouses, suppliers of plants, and their catalogs. The best advice can be obtained from individuals who are presently growing orchids on a small scale. In the book HOW TO GROW RARE GREENHOUSE PLANTS, Ernest Chabot has furnished an extensive list of sources supplying orchids and other exotic plants. Consult the booklet, ORCHID CULTURE by Robert J. Gillespie, published by the Missouri Botanical Garden, St. Louis. The following bulletins will be helpful: BULLETIN OF THE AMERICAN ORCHID SOCIETY and THE ORCHID DIGEST. Such organizations as the *Illinois Orchid Society* (Chicago), the *Central Illinois Orchid Society*, and the *Land of Lincoln Orchid Society* may be interesting and helpful.

A very fine recent work by Harold W. Rickett, of the New York Botanical Garden, WILD FLOWERS OF THE UNITED STATES, THE NORTHEASTERN STATES, Vol. 1, Part One of two parts, contains beautiful color reproductions of orchids. Since Illinois is within the range covered by this botanical work, most of our wild orchids are included in it.

ACKNOWLEDGMENTS

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The following photographic credits are given with the author's gratitude. The frontispiece is by John Gerard, THE NATURE PRESS, Alton, Illinois. The black and white photographs are from kodachromes by Valdemar Schwarz of Blue Island, Illinois; Dr. F. G. Irwin, Decatur, Illinois; and Frederick W. Case Jr. of Saginaw, Michigan. Charles Hodge, Illinois State Museum, prepared many copies of photographs for use in this publication. I am grateful to Ben L. Dolbeare for assistance with proof reading and to Ruth Ann Skeen and Jan Firth for a great deal of typing and other help.

GENERA AND SPECIES OF ORCHIDS OCCURRING IN ILLINOIS

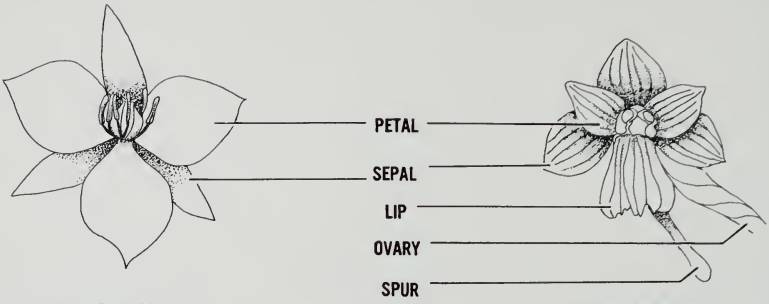
GENUS NAME	TOTAL SPECIES IN THE GENUS*	TOTAL SPECIES IN ILLINOIS
Cypripedium	50	4
Orchis	100	1
Habenaria	500	10
Calopogon	4	1
Triphora	12	1
Pogonia	8	1
Spiranthes	300	6
Goodyera	27	1
Malaxis	250	1
Liparis	262	2
Epipactis	21	1
Aplectrum	1	1
Tipularia	2	1
Corallorhiza	11	3
Hexalectris	6	1

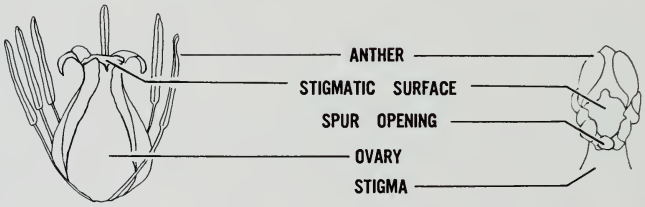
*Approximate numbers indicated; taken from various sources.

CHARACTERISTICS OF THE ORCHIDACEAE

Orchids represent the most advanced stage of evolutionary development in the Monocotyledons. They are perennial herbs with tuberous or fibrous roots and are terrestrial in our area and epiphytic in the tropics. The stems have no annual rings and the leaves are parallel veined. Flowers are perfect but irregular. They have three sepals or two, the latter situation due to a fusion; there are three petals, white or colored, the lateral petals being similar but very different in form, size and color from the third petal which is called the lip or labellum. One or two stamens united with the style form a single structure called a column. The stigma lies on the anterior face of this column and the sessile anthers are located at the sides, or back, or top. Pollen is often united into waxy, spherical masses called pollinia. The ovary is inferior, one-chambered with three carpels and abundant ovules. Each minute seed contained in the three-valved capsule (the matured ovary) has a very small embryo with one cotyledon.

DIAGRAMS OF TRILLIUM AND ORCHID FLOWERS





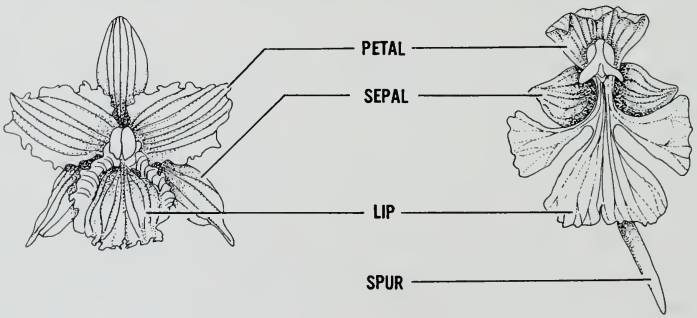


Plate No. 1

KEY TO THE GENERA

1. Flowers with the lip a showy, inflated, sac-like pouch 2 to 5 cm long, its edges rolled inward. CYPRIPEDIUM. Page 11.

1. Flowers with the lip not a showy, inflated, sac-like pouch but flattened or merely curved, much less than 5 cm long.

    2. Plants with green foliage leaves not withered, shredded or scale-like and present at flowering time.

        3. Flowers with a spur projecting from the base of the lip.

            4. Leaves, two, at the base of the plant; the flower stem leafless, ORCHIS. Page 20.

            4. Leaves several or many, borne on the leafy stem. HABENARIA. Page 23. (See page 32-33).

        3. Flowers with no spur projecting from the base of the lip.

            5. Flowers one or few, 15 mm or more in width.

                6. Leaves narrow, long and grass-like or iris-like, flowers bright pink. CALOPOGON. Page 44.

                6. Leaves neither narrow and long nor grass-like or iris-like, flowers not bright pink.

                    7. Flowers several, borne in axils of oval, leaf-like bracts; the lip neither crested nor fringed. TRIPHORA. Page 46.

                    7. Flowers usually one at the top of the stem; the lip crested and fringed. POGONIA. Page 48.

            5. Flowers numerous, in a spike or a raceme, and less than 15 mm in width.

                8. Flowers in a spirally twisted spike, small, greenish or white; leaves uniformly green. SPIRANTHES. Page 51.

                8. Flowers in a spike not spirally twisted, leaves persisting, usually variegated with white veins, at the base of the plant. GOODYERA. Page 64.

                    9. Plant with one or two leaves, flowers light green or pale purple in an erect raceme.

                        10. Plant with one leaf midway up the stem, flowers very small, greenish and crowded near the top. Not spidery in appearance. MALAXIS. Page 66.

10. Plant with two shiny leaves at its base, flowers loosely arranged, larger, pale purple, the sepals and petals narrow, with a spidery appearance. LIPARIS. Page 69.

9. Plant with several or many leaves on the stem, flowers pale purple, often drooping. EPIPACTIS. Page 74.

2. Plants without green foliage leaves at flowering time; if green leaves present they are withered or shredded or reduced to clasping scales.

11. Flowers in a spirally twisted spike. SPIRANTHES. Page 51.

11. Flowers not in a spirally twisted spike.

12. Plants green with a single, oval, withered or shredded leaf at the base.

13. Flowers with no spur; the underside of the leaf green. APLECTRUM. Page 76.

13. Flowers with a long, slender spur; the underside of the leaf purple-green. TIPULARIA. Page 78.

12. Plants with little or no green color, lacking foliage leaves but with several reduced leaves appearing as clasping scales along the stem.

14. Flowers with the lip marked with reddish-purple spots. CORALLORHIZA. Page 81.

14. Flowers with the lip, sepals and petals marked with purple lines. HEXALECTRIS. Page 88.

KEY TO SPECIES OF CYPRIPEDIUM

1. Plant with two basal leaves; the flowering scape leafless. *Cypripedium acaule.* Page 12.

1. Plant bearing several leaves (one to three) or more; not basal. The flowering scape bearing leaves.

   2. Sepals flat, oval, blunt, not twisted. The white lip longer than sepals or petals. *Cypripedium reginae.* Page 14.

   2. Sepals twisted, longer than wide and as long as or longer than the lip.

      3. Lip yellow; 2 to 5 cm long. *Cypripedium parviflorum.* Page 16.

      3. Lip white or cream; 2 to 3 cm long.

         4. Sepals and petals purple to madder purple; lip dull white or cream. *Cypripedium andrewsii.* Page 16, 18. Not illustrated.

         4. Sepals and petals yellow-green; lip white and shiny. *Cypripedium candidum.* Page 18.

CYPRIPEDIUM ACAULE Ait.

Common names: Stemless Lady's Slipper; Pink Moccasin Flower; Pink Lady's Slipper; Two-leaved Lady's Slipper.

Distribution: Northeastern part of the State.*

Habitat: Upland woods; edges of swamps; sandy areas.

Flowering in May.

Predominant flower colors: Yellow-green; brown; deep pink; white.

The two ribbed, opposite leaves of this very uncommon orchid in Illinois sheathe the base of the flowering scape that arises between them. The entire plant ranges from 20 to 45 cm tall. The leaves, somewhat hairy and bearing glands, are from 12 to 24 cm long and from 2.5 to 15 cm wide.

One flower, with a leafy, arching bract inserted below it, is produced. Both sepals and petals are yellow-green or greenish-brown with purple to brown lines. The narrow, tapering, dorsal sepal varies from 3.5 to 5 cm in length and 5 to 15 mm in width. Lateral sepals, completely united, are from 3 to 4 cm long and 1 to 2.5 cm wide. The tapering spirally twisted petals are pubescent on their inner surfaces. and range from 5.5 cm long and 1.5 cm in width at the base.

The pouch-like, inflated lip, from 5 cm to 4 cm wide is deep pink to white with rose-pink veins and has a velvety appearance; it is fissured or folded in front with the edges rolled inward. Its inner surface is also pubescent. Capsules range from 3 to 5 cm in length.

The glandular hairs of Cypripediums may cause a dermatitis or irritation of human skin.

*Frederick W. Case Jr. in *Orchids of the Western Great Lakes Region*, p. 40, states, "Although our distribution map shows no record of *Cypripedium acaule* from Illinois, Jones and Fuller (1955) report that they have seen specimens from Cook County. These specimens were not in the herbaria examined for this study." However, a specimen in the Illinois State Museum Herbarium bears the following data: Collected May 3, 1942, No. 7329, Elk Grove, Des Plaines, Cook Co., Illinois. Moist woods, rare, 6 plants. Collected by Gordon Pearsall.

Plate No. 2

1. Entire plant. Drawing much reduced in size.
2. Side view of flower. Drawing less than one half natural size.

Plate No. 2

CYPRIPEDIUM REGINAE Walt.

Common names: Showy Lady's Slipper; Pink Lady's Slipper; Pink Moccasin Flower; Queen Lady's Slipper.

Distribution: Northern part of the State.

Habitat: Wet woods; mossy wooded slopes; swampy uplands.

Flowering from late May to August.

Predominant flower colors: White and rose-pink.

These erect, leafy plants are hairy-glandular and from 35 to 90 cm tall. There are three to seven sheathing, strongly ribbed leaves, the veins and edges of which are noticeably hairy. The leaves may be from 10 to 30 cm long and 6 to about 15 cm wide.

One flower is generally produced, but there may be several. Each lies in the axil of a leafy, floral bract that is 6 to 10.5 cm long and 2 to 5 cm wide. Sepals and petals are waxy white. The dorsal sepal may be from 3 to nearly 5 cm long and 2.4 to 3.5 cm wide. The fused lateral sepals are 3.5 to 4 cm long and 2 to 3 cm wide. Petals may be round or acute at the tips, 2.5 to 4 cm long, and 1 to 1.5 cm wide.

The white, pouch-shaped, furrowed lip is rose pink in front, and is often veined with purple or rose. It ranges from 2.5 to 5 cm long. Capsules are 3.5 to 4.5 cm long.

The glandular hairs of Cypripediums may cause a dermatitis or irritation of human skin.

Plate No. 3

1. Upper part of the plant. Drawing much reduced in size.
2. Lower part of the plant. Drawing much reduced in size.
3. Capsule. Drawing about one-half natural size.

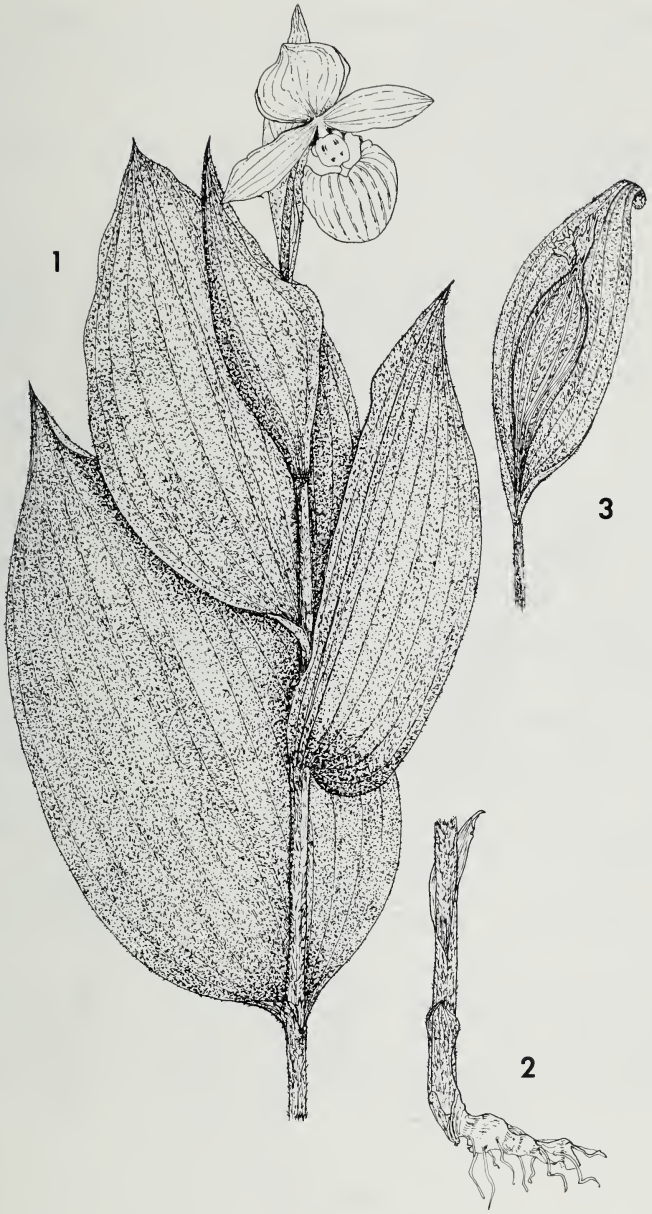


Plate No. 3

CYPRIPEDIUM PARVIFLORUM Salisb.

Common names: Yellow Lady's Slipper; Yellow Moccasin Flower; Downy Lady's Slipper; Venus' Shoe.

Distribution: Scattered localities throughout the State.

Habitat: Ravines; boggy ground; wooded hillsides.

Flowering from May through June.

Predominant flower colors: Cream; white; dull to bright golden yellow; greenish-yellow; madder purple.

Many species and varieties have been named for the Yellow Lady's Slipper and nearly all names are based on variable size and color of the flowers. The erect plants, 10 to 65 cm tall, are hairy and glandular notably at the leaf nodes and on the mature capsule. Leaves vary in number from three to five or more and are 5.5 to 19 cm long and 5 to 10.5 cm in width with blades strongly ribbed.

Floral bracts, 1 to 9 cm long and 1 to 4.5 cm wide, taper to a slender tip. There are one or two fragrant flowers with green-yellow to brown-purple sepals and petals. The large dorsal sepal has wavy margins and is from 2.6 to 7 cm long and 2 to 3 cm wide. The lateral sepals, 2.5 to 7.5 cm long and 2 to 2.5 cm wide, are often completely united; their tips each bear two teeth. Narrow, spirally twisted petals are 5 to 10 cm long and 1 cm wide.

The pouch-shaped, yellow to cream colored lip, 1.5 to 6.5 cm long, is veined or marked with purple on the inside. Capsules vary from 4 to 5 cm in length.

The glandular hairs of Cypripediums may cause a dermatitis or irritation of human skin.

An infrequent hybrid, X *Cypripedium andrewsii* A. M. Fuller, may occur where *C. parviflorum* and *C. candidum* are associated.

Cypripedium parviflorum Salisb. in North America is more western in its range than the related eastern *C. pubescens* Willd. These orchids have been given species rank and have also been reduced to varieties of the Eurasian *C. calceolus*. The reader should consult a discussion by A. M. Fuller in STUDIES ON THE FLORA OF WISCONSIN, PART I: THE ORCHIDS; ORCHIDACEAE, 14: 64-70. Note that under *C. parviflorum*, Distribution in Wisconsin, page 67, Fuller states: "Apparently confined to the glaciated portions of the state." An investigation and consideration of post-glacial migrations of these two North American Cypripediums may have some taxonomic importance.

Plate No. 4

1. Upper part of the plant; side view of the flower. Drawing much reduced in size.
2. Lower part of the plant. Drawing much reduced in size.
3. Capsule. Drawing about one-half natural size.

Plate No. 4

CYPRIPEDIUM CANDIDUM Muhl.

Common names: White Lady's Slipper; Moccasin Flower; Small White Lady's Slipper.

Distribution: Northern half of the State.

Habitat: Open, wet prairies; boggy places.

Flowering from May through June.

Predominant flower colors: Green, greenish-yellow, white.

If any orchid is well-known in Illinois it is probably one of the Lady's Slippers. They are most likely to be recognized by those who frequent nature trails. The plants, from 15 to 40 cm tall, are erect, leafy, glandular and short-hairy. The three or four strongly ribbed leaves, 7 to 19 cm long, 2 to 4 cm wide are stiff and erect.

Each floral bract is leaf-like, erect and from 6 cm long to 2 cm wide. One flower is generally produced at the top of the stem. Sepals are green to green-yellow with deep purple streaks. The twisted dorsal sepal varies from 2 to 3 cm long and 9 to 10.5 mm wide; lateral sepals are very nearly the same size but have two teeth at their tips. The petals, similar in color and also twisted, are from 2.5 to 5 cm long and up to 4 mm wide.

The beautiful lip or "moccasin" is waxy white, shiny, marked by purple veins within at the base and 2 to 2.5 cm long and 1 or more cm wide. Erect capsules vary up to 3 cm long.

The glandular hairs of Cypripediums may cause a dermatitis or irritation of human skin.

An infrequent hybrid, X *Cypripedium andrewsii* A. M. Fuller, may occur where *C. candidum* and *C. parviflorum* are associated.

Plate No. 5

1. Entire plant; side view of the flower. Drawing much reduced in size.
2. Front view of the flower about one-half natural size.

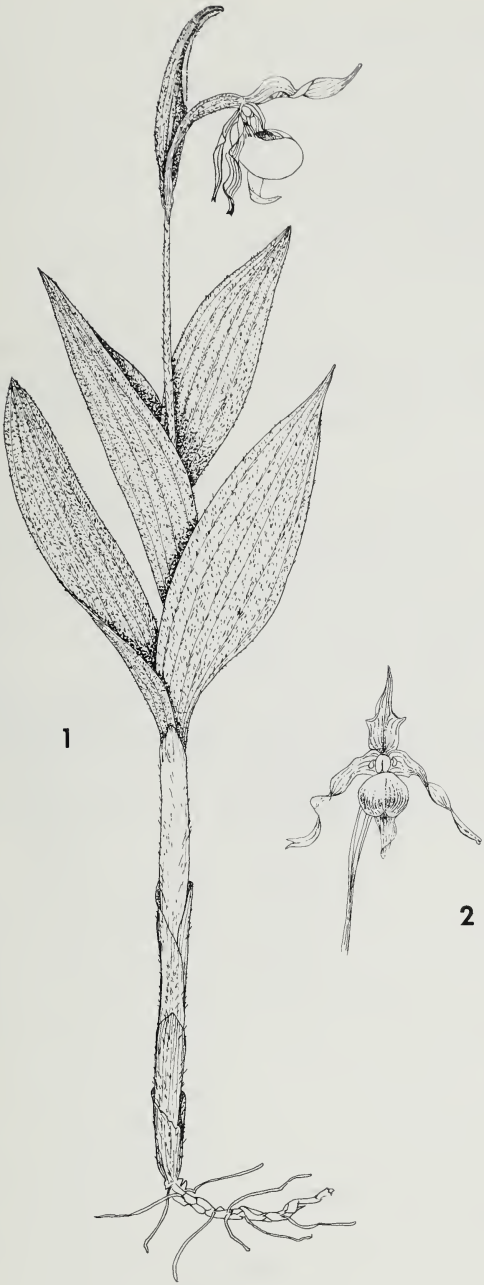


Plate No. 5

ORCHIS SPECTABILIS L.

Common names: Showy Orchis; Two-leaved Orchis; Purple-hooded Orchis.

Distribution: Scattered localities throughout the State.

Habitat: Woodlands with a good cover of humus.

Flowering from May through June depending on north-south distribution in the State.

Predominant flower colors: Pink to pale purple, or almost white.

This plant is completely smooth and may be from 5 to 35 cm in height. The two round to oval, basal leaves, are deep green, smooth, shiny, and range from 5.5 to 20 cm long and 3.5 to 10 cm wide.

The number of flowers varies from a few to a dozen. The rather large bract below each flower, exceeding it in length, is from 2 to 7.5 cm long and from 1.5 to 1.8 cm wide. Sepals and petals of the attractive pink to pale purple flowers form a hood over the column. The sepals may be from 1.5 to 2 cm long and 5 to 6 mm wide below the middle. The petals vary from 1 to 1.5 cm long and 2.5 to 4 mm wide near the base.

The lip is white, broadly oval, 1 to nearly 2 cm long and 7 to 14.5 mm wide. Its base is continued into a slender spur from 1.5 to 2 cm long. The capsule varies from 1.5 to 2.5 cm long.

Orchis is called the type genus (ideal representative) of the Orchid Family.

Plate No. 6

1. Entire plant. Drawing much reduced in size.
2. Front view of the flower. Drawing about twice natural size.
3. Side view of the flower. Drawing about twice natural size.
4. Capsules. Drawing about natural size.

Plate No. 6

KEY TO SPECIES OF HABENARIA

1. Flowers greenish, small, not showy; lip neither fringed nor three-parted.
   2. Plants with leaves borne on the stem.
      3. Leaves several; lower bracts below flowers longer than the flowers.
         4. Lip not entire.
            5. Lip with three teeth at the apex; spur shorter than the lip. *Habenaria bracteata.* Page 24.
            5. Lip with one lobe or tooth on each side near the base, and a protuberance (swelling) between the lobes; spur longer than the lip. *Habenaria flava.* Page 26.
         4. Lip entire; not as long as the slender spur. *Habenaria huronensis.* Page 28.
      3. Leaves one or two; bract below the flower shorter than the ovary and flower. *Habenaria clavellata.* Page 30.
   2. Plants with leaves only at the base. *Habenaria hookeri.* Page 32.
1. Flowers brightly colored, larger, showy; the lip fringed or with deep lobes.
   6. Lip simple (with no lobes), broadly oval with weak, slender fringes; flower bright yellow to orange. *Habenaria ciliaris.* Page 34.
   6. Lip three-lobed; either fringed or toothed.
      7. Flowers greenish-yellow or white
         8. Flowers greenish-yellow, petals entire, spur as long or slightly longer than the lip. *Habenaria lacera.* Page 36.
         8. Flowers white to cream-white, petals toothed, spur much longer than the lip. *Habenaria leucophaea.* Page 38.
      7. Flowers lilac-pink to deep purple.
         9. Flowers lilac-pink to pale purple; lip deeply fringed. *Habenaria psycodes.* Page 40.
         9. Flowers deep purple; lip irregularly toothed, not fringed. *Habenaria peramoena.* Page 42.

HABENARIA BRACTEATA (Muhl.) R. Br.

Common names: Long-bracted Green Orchid, Long-bracted Orchid; Frog Orchid.

Distribution: Northern part of the State.

Habitat: Moist soil in woods; wet prairies; swampy areas.

Flowering from May through June.

Predominant flower color: Green.

The plants are glabrous, from 15 to 40 cm tall, and with numerous sheathing leaves along the stem. The larger lower leaves are 5 to 15 cm long and 1 to 6 cm wide; leaves become successively smaller on the upper stem below the flowers.

There may be many to few flowers in a raceme. Green bracts below the flowers are conspicuous, from 1 to 5.5 cm long, and generally much longer than the flowers. The curved dorsal sepal ranges from 3 to 5.5 mm long and 2 to 4 mm wide and lateral sepals are only slightly larger. Petals are very small and may be up to 5 mm in length.

The lip, 5 to 10.5 mm long and 2 to 5 mm wide has three shallow teeth at its tip. The middle tooth is generally much less conspicuous than the other two. The short, sac-like, spur is a feature which helps to identify this orchid.

Plate No. 7

1. Entire plant. Drawing much reduced in size.
2. Front view of the flower. Drawing about one-half natural size.
3. Side view of the flower. Drawing about one-half natural size.
4. Capsules. Drawing much reduced in size.

Plate No. 7

HABENARIA FLAVA (L.) R. Br.

Common names: Southern Rein-orchid; Tubercled Orchid.

Distribution: Northern part of the State and in scattered localities in southern Illinois.

Habitat: Wet woodlands and thicket; bogs; swamps; marshes.

Flowering from June through July.

Predominant flower colors: Pale yellow to green-yellow.

This orchid is among the least conspicuous and showy of our Rein Orchids. The plants, 15 to 50 cm tall, generally bear from two to three leaves which sheathe the stem at the base. A leaf may be from 6 to 20.5 cm long and 1 to 4.5 cm wide. The long, narrow bracts below the flowers are either as long as or shorter than the small flowers borne in a raceme.

The small sepals are from 2 to 5 mm long and 1 to 2.5 mm wide. Petals too, are very small and have about the same measurements as the sepals.

The lip, usually with a conspicuous lobe on either side near the base is 2 to 6 mm long and 1.5 to 5 mm wide across the base and including the two basal lobes. The small, slender spur is from 5 to 10 mm long.

Plate No. 8

1. Entire plant. Drawing much reduced in size.
2. Front view of the flower. Drawing about 3 times natural size.
3. Side view of the flower. Drawing about 3 times natural size.

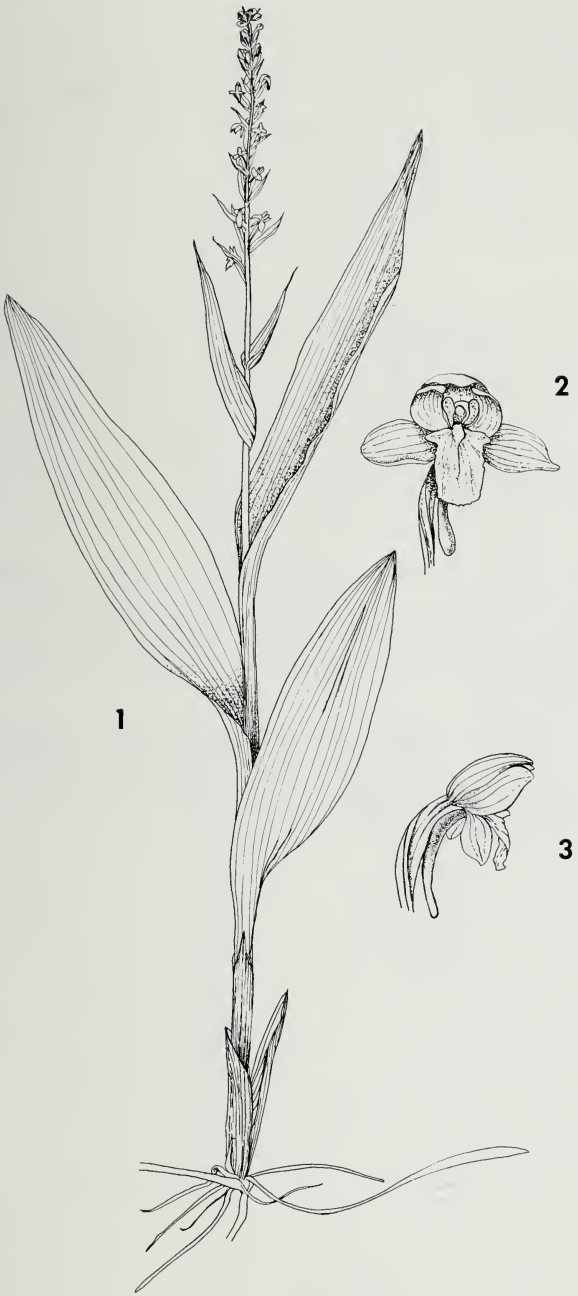


Plate No. 8

HABENARIA HURONENSIS (Nutt.) Spreng.

Common names: Green-flowered Bog Orchid; Northern Green Orchid; Leafy Green Orchid.

Distribution: Mostly in the northern half of the State.

Habitat: Wet thickets and in swamps.

Flowering from June through July.

Predominant flower colors: Green; green-yellow.

This orchid is sometimes listed as *Habenaria hyperborea* (L.) R. Br. and the species name "hyperborea" indicates its northern distribution. The plants are glabrous, 10 to 100 cm tall, with a leafy stem, or, leaves mostly at the base of the plant. Leaves vary from 5 to 30 cm in length and from 1 to 5 cm in width. The fragrant flowers in the raceme may be very few to many in number. The lowest bracts below the flowers are usually much longer than the flowers.

The dorsal sepal, rounded at the tip and from 3 to 6.5 mm long and 1 to 4 mm wide, converges with the petals to form a hood over the column. Lateral sepals, 2 to 10 mm long and 1 to 4 mm wide, bend backward. The thickened petals are 3 to 6.5 mm long and 1 to 3.5 mm wide.

The lip is fleshy, tapering at the tip, curved upward, and varies from 4 to 10 mm long and 1.5 to 3 mm wide. The spur is variable and may appear slender or stout. It is from 2.5 to 7 mm long and is usually shorter than the lip.

Plate No. 9

1. Entire plant. Drawing much reduced in size.
2. Front view of the flower. Drawing about 3 times natural size.
3. Side view of the flower. Drawing about 3 times natural size.

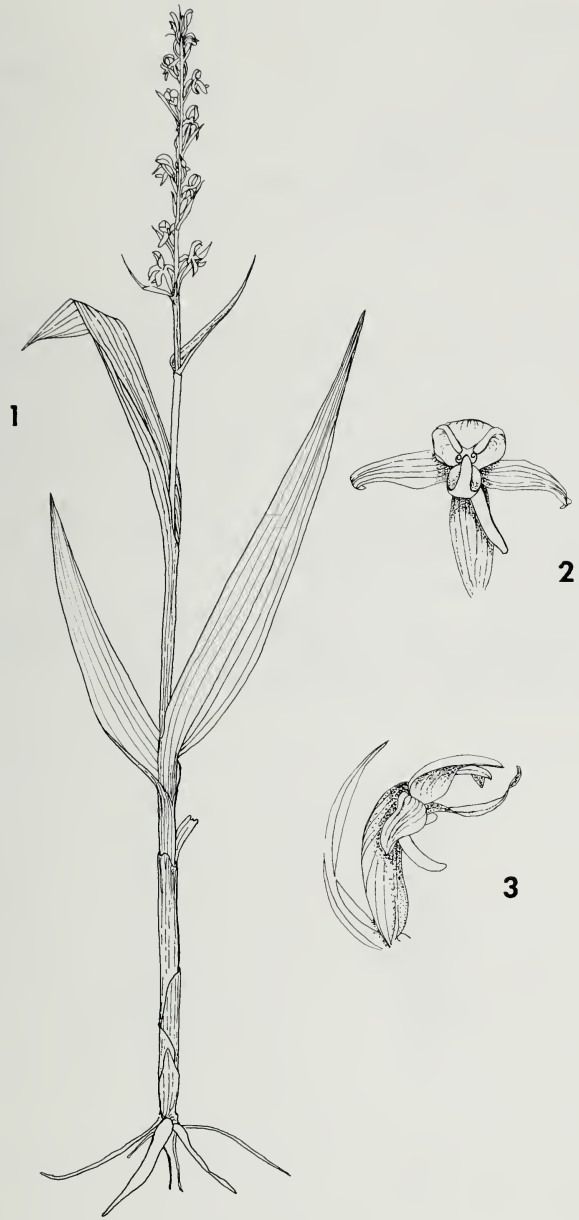


Plate No. 9

HABENARIA CLAVELLATA (Michx.) Spreng.

Common names: Green Rein-orchid; Wood Orchid; Small Green Wood Orchid.

Distribution: Northern and southern parts of the State.

Habitat: Sometimes in water along streams; swamps; marshes; open areas in moist soil.

Flowering from July through August.

Predominant flower colors: Pale yellow to green.

This orchid is a rather small plant, completely glabrous and from 10 to 40 cm tall. One large leaf, with a rounded apex and ranging from 4 to 17.5 cm long and 1 to 4 cm wide, is generally found near the mid-part of the stem. The upper leaves are bract-like. Bracts below the flowers are narrow, sharp-tipped and from 2 to 12 mm long. Flowers in the raceme are seldom numerous.

The oval sepals, rounded at the tips range between 5 mm in length to 2.5 mm in width. Petals are similar in shape and from 3.5 mm long and up to 2 mm wide.

The lip, with a blunt, truncate, three-tipped apex, is from 3 to 7.5 mm long and about 4 mm wide at the apex. A slender spur, longer than the ovary, is about 10 mm in length.

Plate No. 10

1. Entire plant. Drawing slightly larger than natural size.
2. Front view of the flower. Drawing about 5 times natural size.
3. Side view of the flower. Drawing about 5 times natural size.
4. Capsules. Drawing about natural size.

Plate No. 10

HABENARIA HOOKERI Torr.

Common names: Round-leaved Orchid; Hooker's Round-leaved Rein Orchid.

Distribution: Northeast part of the State.

Habitat: Moist humus of woodlands; swampy areas.

Flowering from June through July.

Predominant flower colors: Green to yellow-green.

This orchid is completely glabrous, 20 to 40 cm tall and has two shiny, basal leaves. These broad leaves, spreading and resting on the ground, are from 6 to 14.5 cm long and 5 to 12 cm wide. The stem, bearing the flowering raceme, may have a single leaf-like bract near its middle. Bracts below the flowers are about 1.5 cm in length and 5 mm wide. Flowers may vary from a few to a dozen in number.

The dorsal sepal, 7 to 10 mm long and 3 to 5.5 mm wide at the base, converges with the petals as a hood over the column. Lateral sepals are bent strongly backward and range from 8 to 13 mm long and 2 to 4 mm wide. The narrow petals may be from 7 to 10 mm long and 1 to 2 mm wide at their bases.

The thickened, triangular lip tapers to its upturned tip and is from 8 to 12 mm long and 3 to 4.5 mm wide at the base. The tapering spur, broadest at its base, ranges from 1.5 to nearly 3 cm in length.

Plate No. 11

1. Entire plant. Drawing reduced in size.
3. Side view of the flower. Drawing about twice natural size.
3. Side view of the flower. Drawing about twice natural size.

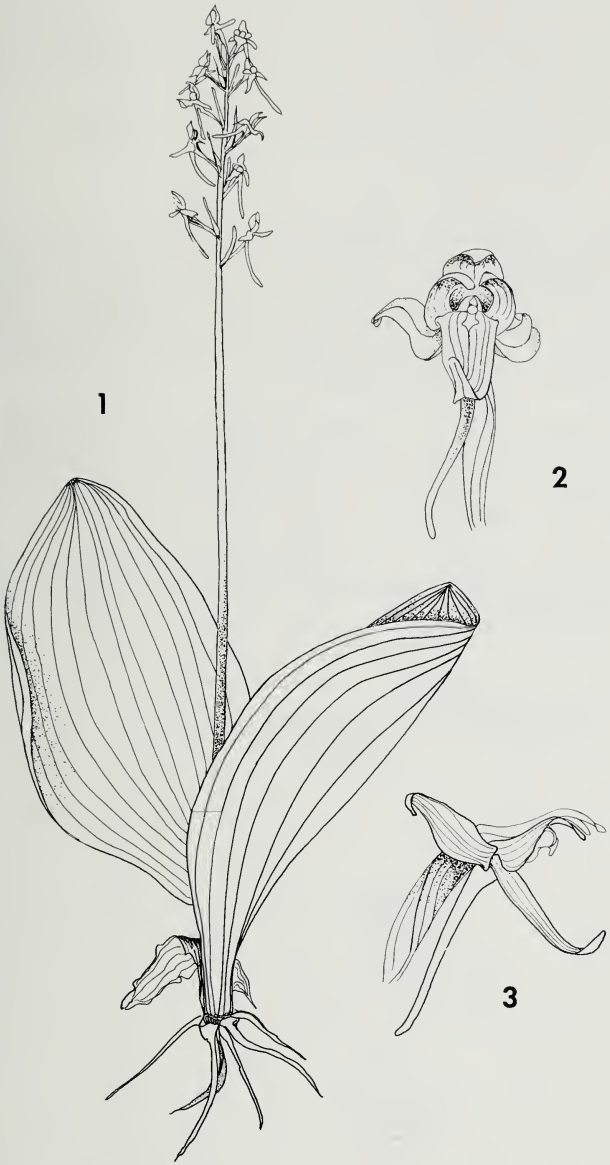


Plate No. 11

HABENARIA CILIARIS (L.) R. Br.

Common names: Yellow Fringed Orchid; Orange Fringed Orchid.

Distribution: Northeastern part of the state.

Habitat: Swamps and marshes; bogs; wet flood-plain woods.

Flowering from June through July.

Predominant flower colors: Bright yellow to orange.

Plants are completely glabrous, 20 to 90 cm tall with several leaves sheathing the stem at their bases. The narrow, pointed leaves, ridged on the lower surface, range from 6 to 25 cm in length and up to 6 cm in width. Long, narrow bracts below the flowers may be from 1.5 to 2.5 cm in length. Flowers in a raceme vary from few to many and are very showy.

The concave dorsal sepal is from 3 to 10 mm long and 4 to 5 mm wide. Lateral sepals, with rounded tips, are about the same size. The narrow petals, 5 to 7 mm long and up to 2 mm wide, are shallowly toothed at the tips.

The lip is flat, 7.5 to 12.5 mm long and 2.5 to 3 mm wide, with weak, hanging fringes. A slender spur, 2 to 3.5 cm long, exceeds the ovary in length.

Plate No. 12

1. Lower part of the plant. Drawing reduced in size.
2. Upper part of the plant. Drawing reduced in size.
3. Side view of the flower. Drawing about 3 times natural size.
4. Front view of the flower. Drawing about 3 times natural size.

Plate No. 12

HABENARIA LACERA (Michx.) Lodd.

Common names: Ragged Orchid; Green-fringed Orchid.

Distribution: Northeastern, east-central and extending to the southern part of the State.

Habitat: Swamps; bogs; marshes; thickets and open prairie areas.

Flowering from June through July.

Predominant flower colors: Green to yellow-green.

These glabrous, leafy plants are from 20 to 70 cm tall with the upper leaves reduced to large bracts. The basal parts of the stiff leaves sheathe the stem. Lower leaves may be from 6 to 20 cm long and 1 to 5 cm wide. The flowers are many or few in a raceme. Floral bracts exceed the ovaries in length, but are seldom longer than the flowers.

The small dorsal sepal is from 4 to 5 mm long and 3.5 to 4.5 mm wide. Lateral sepals are similar in size. The petals are also very small ranging in size from 4.5 to 7 mm long and about 2 mm wide; they are slightly toothed at their tips.

The lip, deeply three-parted, may be from 1 to 1.5 cm long and from 1.5 to 1.8 cm wide across its two lateral divisions, which may also be deeply divided into three lobes. The edges of the lobes are coarsely and unevenly fringed. The slender spur, 1 to 2.5 cm long, is curved and as long as or longer than the ovary.

Plate No. 13

1. Entire plant. Drawing much reduced in size.
2. Front view of the flower. Drawing about twice natural size.
3. Side view of the flower. Drawing about twice natural size.

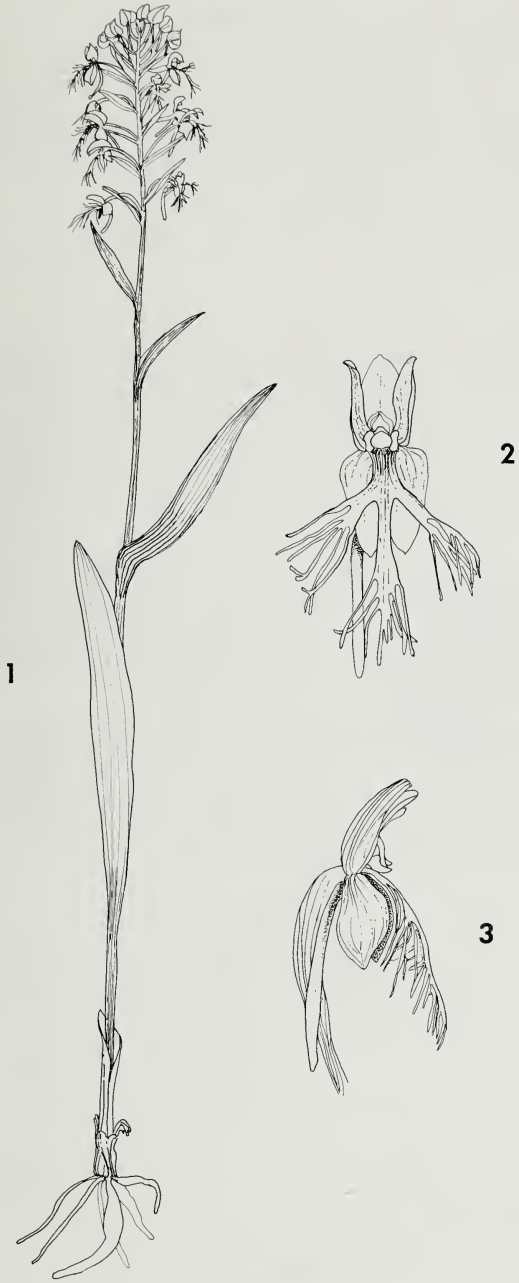


Plate No. 13

HABENARIA LEUCOPHAEA (Nutt.) A. Gray

Common names: White-fringed Orchid; Prairie White-fringed Orchid.

Distribution: Northern two-thirds of the State.

Habitat: Wet areas in prairie remnants; boggy places in fields; along R. R. rights-of-way with other prairie plants.

Flowering from June through July.

Predominant flower colors: White or sometimes pale green.

The plants are completely glabrous, rather large, and range from 15 to 120 cm in height. There are several leaves, each sheathing the stem below and arranged along the angled stem. Leaves may be from 6.5 to 20 cm long and 1 to 4 cm wide. Flowers are numerous in a large raceme. Narrow floral bracts below the flowers range from 1.5 to 5 cm long and 4 to 6 mm wide near their bases.

Sepals and petals bend forward to form a hood over the column. The dorsal sepal is from 7 to 15.5 mm long and 4.5 to 10 mm wide. Lateral sepals are very nearly the same size as the dorsal. The narrow petals, with coarse teeth near their tips, are from 6 to 17 mm long, 5 to 10.5 mm wide.

The three-parted lip, deeply incised, ranges from 1.5 to 3.5 cm long and 1 to 3.5 cm wide across its two lateral divisions. All three divisions of the lip are fringed nearly halfway to their bases. The spur is curved, 2.5 to 6 cm in length, somewhat club-shaped near its tip, and much longer than the ovary.

Plate No. 14

1. Lower part of the plant. Drawing much reduced in size.
2. Upper part of the plant. Drawing much reduced in size.
3. Front view of the flower. Drawing about twice natural size.
4. Side view of the flower. Drawing about twice natural size.

Plate No. 14

HABENARIA PSYCODES (L.) Spreng.

Common names: Purple-fringed Orchid; Small purple-fringed Orchid; Butterfly Orchid.

Distribution: Northern part of the State.

Habitat: Swamps; borders of woods.

Flowering from July through August.

Predominant flower color: Pale purple to lilac, rarely white.

These plants, from 15 to 90 cm tall, are entirely glabrous. Leaves sheathe the stem below and may be five or less in number. The leaf blade may be from 5 to 20 cm long and 2 to 7 cm wide. Flowers are few or many, borne in a raceme. Each flower lies in the axil of a narrow floral bract 1 to 5 cm long and 3 to 4.5 mm wide at the base.

The dorsal sepal varies from 5.5 to 6.5 mm long and 2 to 4 mm wide. Lateral sepals are from 4 to 6.5 mm long and 3.5 to 4 mm wide. The petals, irregularly toothed along their margins, are from 5 to 10 mm long and 6.5 mm wide near the tips.

The deeply, three-parted lip is from 7 to 13.5 mm long and 8 to 14.5 mm wide across the two lateral divisions all of which are deeply cut and coarsely toothed along the tips. The curved, slender spur is longer than the ovary and may range from 1.5 to 2.3 cm in length.

Plate No. 15

1. Lower part of the plant. Drawing much reduced in size.
2. Upper part of the plant. Drawing much reduced in size.
3. Front view of the flower. Drawing about 3 time natural size.
4. Side view of the flower. Drawing about 3 times natural size.

Plate No. 15

HABENARIA PERAMOENA A. Gray

Common name: Fringeless Purple Orchid.

Distribution: Southern half of the State.

Habitat: Moist edges of woods; wet fields; open grassy areas.

Flowering from July through August.

Predominant flower colors: Purple; rose-purple; pale purple.

These entirely glabrous plants, from 30 to 100 cm tall, bear several large leaves 6 to 12 cm long and 1 to 6 cm wide. The upper leaves are greatly reduced in size. The flowers in a raceme may be few or many in number. Lower narrow bracts below the flowers are about as long as the ovary but not as long as the flower.

The dorsal sepal is 4.5 to 8 mm long and about as wide. Lateral sepals are 5.5 to 7.5 mm long and 3 to 5.5 mm wide. The petals, with shallow teeth along their tips, range from 4 to 8.5 mm long and 3 to 7.5 mm wide.

The lip, deeply three-parted, is usually incised to at least one third of the distance from the edge. The lip ranges from 6 to 12 mm long and from 8 to 14 mm wide across the two lateral lobes. All of the lip's divisions have shallow teeth on the tips. The spur, slender and curved, is from 1 to 2.5 cm long and greatly exceeds the ovary in length.

Plate No. 16

1. Lower part of the plant. Drawing much reduced in size.
2. Upper part of the plant. Drawing much reduced in size.
3. Front view of the flower. Drawing about twice natural size.
4. Side view of the flower. Drawing about twice natural size.

Plate No. 16

CALOPOGON PULCHELLUS (Salisb.) R. Br.

Common names: Grass-pink Orchid; Tuberous-rooted Calopogon.

Distribution: Northern half of the State.

Habitat: Wet depressions of prairies; sandy peat in open, wooded areas.

Flowering from June through July.

Predominant flower color: Pink to rose-purple. Sometimes white-flowered plants are found.

The Latin name *pulchellus* was well chosen, for it means beautiful and this orchid is indeed just that. The plants are smooth and from 10 to 140 cm tall. There is seldom more than one leaf, 40 to 50 cm long and 4.5 to 5 cm wide, arising from the base of the plant. The leaf blade, prominently ribbed, reminds one of a gladiolus leaf. A tapering bract below each flower is about 10 mm long.

The dorsal sepal, 2 to 2.5 cm long and 5 to 10 mm wide, has a small apiculus or tooth at its apex. The lateral sepals are slightly wider but not as long as the dorsal sepal. The petals, constricted near the middle, are generally broadly rounded at the apex. They may be from 1.5 to 2.5 cm long and 5 to 10 mm wide below the constriction.

The lip is 1.5 to 2 cm long, three-lobed, conspicuous and erect. The disc is bearded along the three central veins. The longer hairs of the "beards" are pink to purple; the shorter hairs are pale cream with yellow to orange tips. The incurved, broadly winged column of each flower is 1.5 to 2 cm long and 5 to 8.5 mm wide at the wings. The three-angled capsules are strongly ribbed, and 1 to 2.3 cm long.

Plate No. 17

1. Entire plant. Drawing a little more than natural size.
2. Front view of the flower. Drawing a little less than natural size.
3. Side view of the flower. Drawing a little less than natural size.
4. Capsules. Drawing about natural size.

Plate No. 17

TRIPHORA TRIANTHOPHORA (Sw.) Rydb.

Common names: Nodding Pogonia; Three Birds Orchid.

Distribution: Probably state wide in suitable habitats.

Habitat: Rich, loamy soil near streams; edges of swamps.

Flowering from June through July.

Predominant flower colors: Pale pink to nearly white with veins of purple and green.

The name "trianthophora" refers to the three flowers usually produced by plants of this species. The plant is smooth and from 7.5 to 30 cm tall, slender to stout, and usually brown-red to maroon in color. The small leaves, 7.5 to 20 mm long and 5 to 12 mm wide, are arranged alternately along the stem.

The flowers are borne in axils of upper leaves. Each dorsal sepal is about 1.5 cm long and 5 mm wide, and the lateral sepals are only slightly smaller. The petals are about 1.5 cm long and 4 mm wide.

The lip has three lobes with the mid-lobe much larger, it ranges from a little over 1 to 1.6 cm long. The large middle lobe is crested along its midline. The pendent capsules are from 1.5 to 2.3 cm long.

Nodding Pogonia produces stolons at the ends of which tubers occur.

Plate No. 18

1. Entire plant. Drawing about natural size.
2. Front view of the flower. Drawing about twice natural size.
3. Side view of the flower. Drawing about twice natural size.
4. Capsule. Drawing about natural size.

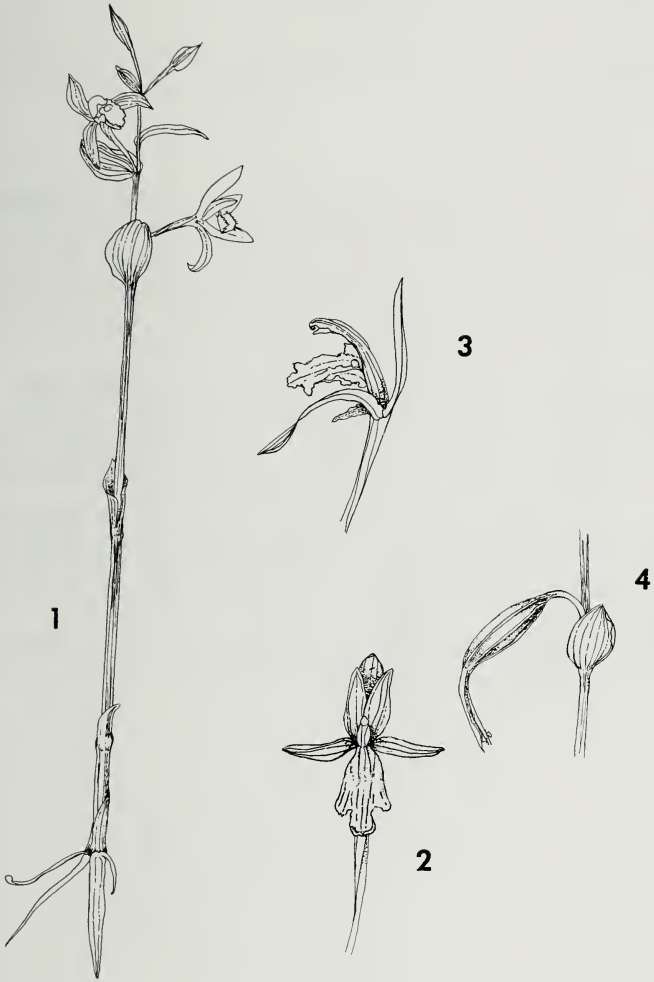


Plate No. 18

POGONIA OPHIOGLOSSOIDES (L.) Ker.

Common names: Rose Crested Orchid; Rose Pogonia; Sweet Crest Orchid.

Distribution: Northern part of the State.

Habitat: Bogs; swamps; low, wet open woods.

Flowering from June through July.

Predominant flower color: Rose or rose-pink. White flowered plants have been reported.

In suitable habitats elsewhere, this orchid is often abundant, but it is not common in Illinois. The slender, smooth plants range from less than 10 to more than 65 cm tall. A single leaf, 2.5 to 12 cm long and from 1 to 3 cm wide is produced about half way up the stem. The leaf-like bract below a flower is from 1 to 2.5 cm long and 3 to 8.5 mm wide.

One to three fragrant flowers occur on a single stem. The dorsal sepal is from 1.5 to 2.5 cm long and 3 to 5.5 mm wide and the lateral sepals are very nearly the same size. The petals, broadly rounded at the apex, are 1.5 to 2.5 cm long and 5 to 10.5 mm wide.

The lip is narrowly spatula-shaped, 1.5 to 2.5 cm long and 8.5 to 10 mm wide, toothed along its apical margin and bearded with whitish bristles on three central veins of the disc. The ellipsoid, erect, capsules are from 2.5 to 3 cm long.

Roots are slender and fibrous and the plant may propagate by means of underground root shoots.

Plate No. 19

1. Entire plant. Drawing about natural size.
2. Front view of the flower. Drawing slightly enlarged.
3. Side view of the flower. Drawing slightly enlarged.
4. Capsule. Drawing a little less than natural size.

Plate No. 19

KEY TO SPECIES OF SPIRANTHES

1. Flowers in a single, loosely arranged, spiral rank or row in the raceme.
   2. Leaves basal, oval, usually not present at flowering time; all parts of the stem smooth (glabrous).
      3. Lip of the flower entirely white. *Spiranthes grayi.* Page 52.
      3. Lip of the flower white with a central green stripe. *Spiranthes gracilis.* Page 54.
   2. Leaves extending up the stem, longer than wide, usually present at flowering time; upper part of the stem hairy (pubescent). *Spiranthes vernalis.* Page 56.
1. Flowers in two or three closely arranged spiral ranks or rows in the raceme.
   4. Flowering stalk slender. Sepals and petals (perianth) 3 to 8 mm long. Lip white, somewhat hairy or if not hairy with a mid-yellow stripe.
      5. Lip smooth (glabrous) white with a mid-yellow stripe. Plants blooming in spring and summer. *Spiranthes lucida.* Page 58.
      5. Lip somewhat hairy (pubescent); white with no mid-yellow stripe. Plants blooming in autumn. *Spiranthes ovalis.* Page 60.
   4. Flowering stalk stout. Sepals and petals (perianth) 7.5 to 10.5 mm long. Lip white, pubescent, and with no mid-yellow stripe. Plants blooming in autumn. *Spiranthes cernua.* Page 62.

SPIRANTHES GRAYI Ames.

Common names: White Spiral Orchid; Little Ladies' Tresses.

Distribution: Southern part of the State.

Habitat: Dry woods of bluff tops and rocky ledges.

Flowering in July.

Predominant flower color: White.

These are generally slender, smooth plants 6.5 to 55 cm tall with basal leaves 2.5 to 6 cm long and 5 to 14 mm wide. Sometimes only remnants of the leaves are present at time of flowering. Closely sheathing, leaf-like bracts occur along the stem.

The floral bracts have slender, tapering tips and the small, white flowers occur in a single rank or row. Sepals and petals are about the same size, 2 to 4 mm long. Petals adhere to the dorsal sepal.

The lip is recurved, 2.5 to 4 mm long and 1 to 2 mm wide, with a wavy margin.

This little orchid may be the most uncommon *Spiranthes* in Illinois.

Plate No. 20

1. Entire plant. Drawing about natural size.
2. Front view of a flower. Drawing is greatly enlarged.
3. Side view of the flower. Drawing is greatly enlarged.

Plate No. 20

SPIRANTHES GRACILIS (Bigel.) Beck

Common names: Slender Ladies' Tresses; Green Spiral Orchid.

Distribution: Scattered localities throughout the State.

Habitat: Dry, open woods; dry fields and grassy areas.

Flowering from July through September.

Predominant flower color: White, although a green stripe through the center of the lip may be apparent.

These are smooth, slender and graceful plants that grow from 20 to 75 cm tall. The leaves are basal, 1.5 to 7 cm long and 1 to 2.5 cm wide, generally absent at flowering time.

The numerous small white flowers occur in a single, spirally twisted row or rank. The slender-tipped floral bracts are from 5 to 9 mm long. Both sepals and petals are about 4.5 to 5 mm long with the dorsal sepal adhering to the petals.

The lip, 4.5 to 6 mm long and 2.5 mm wide, has a wavy, fringed margin and a central green stripe.

Plate No. 21

1. Entire plant. Drawing is slightly less than natural size.
2. Front view of the flower. Drawing about 5 times natural size.
3. Side view of the flower. Drawing about 5 times natural size.
4. Capsules. Slightly less than natural size.

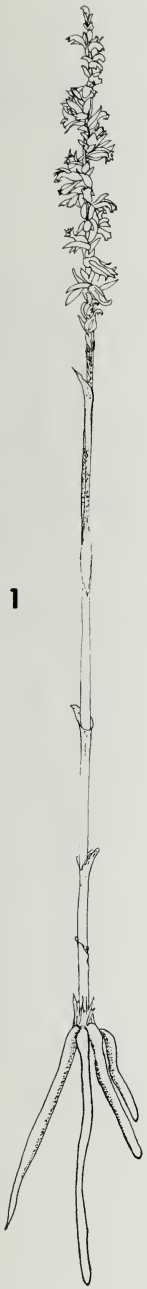


Plate No. 21

SPIRANTHES VERNALIS Engelm. & Gray

Common names: Spring Tresses; Spring Ladies' Tresses.

Distribution: Southern half of the State.

Habitat: Floodplains; low prairie areas; open woodlands.

Flowering from May through summer months.

Predominant flower color: Yellow-white to cream.

Upper parts of this plant are densely hairy. The plant varies from 20 to 110 cm in height. Leaves occur at the base or extend partly up the stem; they are often from 30 to 35 cm in length and about 1 cm in width.

The yellow-white, fragrant flowers are generally arranged in a single spiral row or rank. Floral bracts are from 6.5 to 15 mm long with abruptly tapering tips. The dorsal sepal may be from 5 to 10 mm long and 2 to 3 mm wide. Lateral sepals are very nearly the same size. The petals, 5.5 to 10 mm long or 1 or 2 mm wide, adhere to the dorsal sepal.

The thickened lip is 4 to 8 mm long and 2 to 6 mm wide at the base; it is wavy-margined near its tip.

Plate No. 22

1. Lower part of the plant. Drawing about natural size.
2. Upper part of the plant. Drawing about natural size.
3. Front view of the flower. Drawing about 3 times natural size.
4. Side view of the flower. Drawing about 3 times natural size.

Plate No. 22

SPIRANTHES LUCIDA (H. H. Eaton) Ames

Common names: Shining Ladies' Tresses; Wide-leaved Ladies' Tresses.

Distribution: Scattered localities in the northern part of the State.

Habitat: Bogs; wet grassy areas; gravelly banks.

Flowering from late May through June.

Predominant flower color: White with a yellow stripe or band through the center of the lip.

These plants are generally slender, small and with parts smooth below and rather hairy above. They are 6 to 35 cm tall. Several thick, smooth and shiny leaves, 2 to 12.5 cm long and 4.5 to 18 mm wide grow from the base of the stem.

The small, white flowers occur in one row or rank or appear as two or more spirally twisted rows. The dorsal sepal, 4.5 to 5 mm long and from 1 to 2 mm wide, appears to be connected with the petals which form a hood over the column. Lateral sepals are somewhat longer. The petals range from 5 to 6 mm and a little more than 1 mm wide.

The lip, 4.5 to 5.5 mm long and 2 to 3 mm wide diverges at its apex and its margins are wavy and folded. A broad, yellow mid-stripe on the lip helps to identify this species.

The roots are fleshy at the thickened base of the plant.

Plate No. 23

1. Entire plant. Drawing about natural size.
2. Front view of the flower. Drawing about twice natural size.
3. Side view of the flower. Drawing about twice natural size.

Plate No. 23

SPIRANTHES OVALIS Lindl.

Common names: Lesser Ladies' Tresses; Oval Ladies' Tresses.

Distribution: Southern half of the State.

Habitat: Moist, shady woodlands; grassy areas in low ground.

Flowering from late August through September and October.

Predominant flower color: White.

These are small plants, 6 to 35 cm tall. Their lower parts are smooth and the slender upper parts are somewhat hairy. Leaves, forming clusters at the base and on the lower stem, are 2.5 to 12 cm long and 5 to 17 mm wide.

The white, tubular flowers occur in one or in two or more spirally twisted rows on a slender spike. Bracts below the flowers vary from 1 to 1.5 cm long. The dorsal sepal, 4 to 5 mm long and 1 to 1.8 mm wide, is united with the petals to form a hood over the column. Lateral sepals are about 6 mm long and 1.5 mm wide. The small, narrow petals are 5.5 to 6 mm long and from less than 1 to 1.2 mm wide.

Each lip has a broad mid-stripe of yellow and green lines and varies from 5.5 mm long to 2.8 mm wide.

Plate No. 24

1. Entire plant. Drawing about natural size.
2. Front view of the flower. Drawing about 4 times natural size.
3. Side view of the flower. Drawing about 3 time natural size.

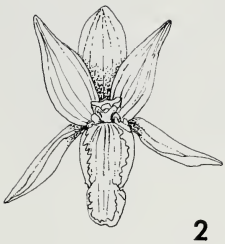


Plate No. 24

SPIRANTHES CERNUA (L.) Rich.

Common names: Nodding Ladies' Tresses; Autumn Nodding Tresses.

Distribution: Scattered localities throughout the State.

Habitat: Swamps; edges of lakes and streams; wet woods; wet fields and grassy areas.

Flowering from August through October.

Predominant flower color: White.

Except for the leaves, species of Spiranthes will appear to resemble Rattlesnake Plantain. Nodding Ladies' Tresses may grow from 10 to 50 cm tall. Two to several leaves 4 to 25 cm long and 5 to 15 mm wide arise from the base of the plant. The plant is smooth below and hairy in its upper parts.

Small, fragrant flowers appear in two or more spiral or nearly straight rows. The bract below each flower is conspicuous and from 7.5 to 15 mm long. Sepals and petals are hairy on the outer surface. The dorsal sepal is from 5 to 10 mm long and from 1.5 to 3 mm wide at its base; the recurved lateral sepals are about the same length but narrower. Petals are adherent to the dorsal sepal and are from 5 to 10 mm long and 1.5 to 3 mm wide.

The lip is 5 to 10 mm long and 3 to 5.5 mm wide; it is curved near the middle and has crisped and folded margins.

Plate No. 25

1. Entire plant. Drawing about natural size.
2. Front view of a flower. Drawing about 3 times natural size.
3. Side view of the flower. Drawing about 3 times natural size.
4. Capsules. Drawing about natural size.

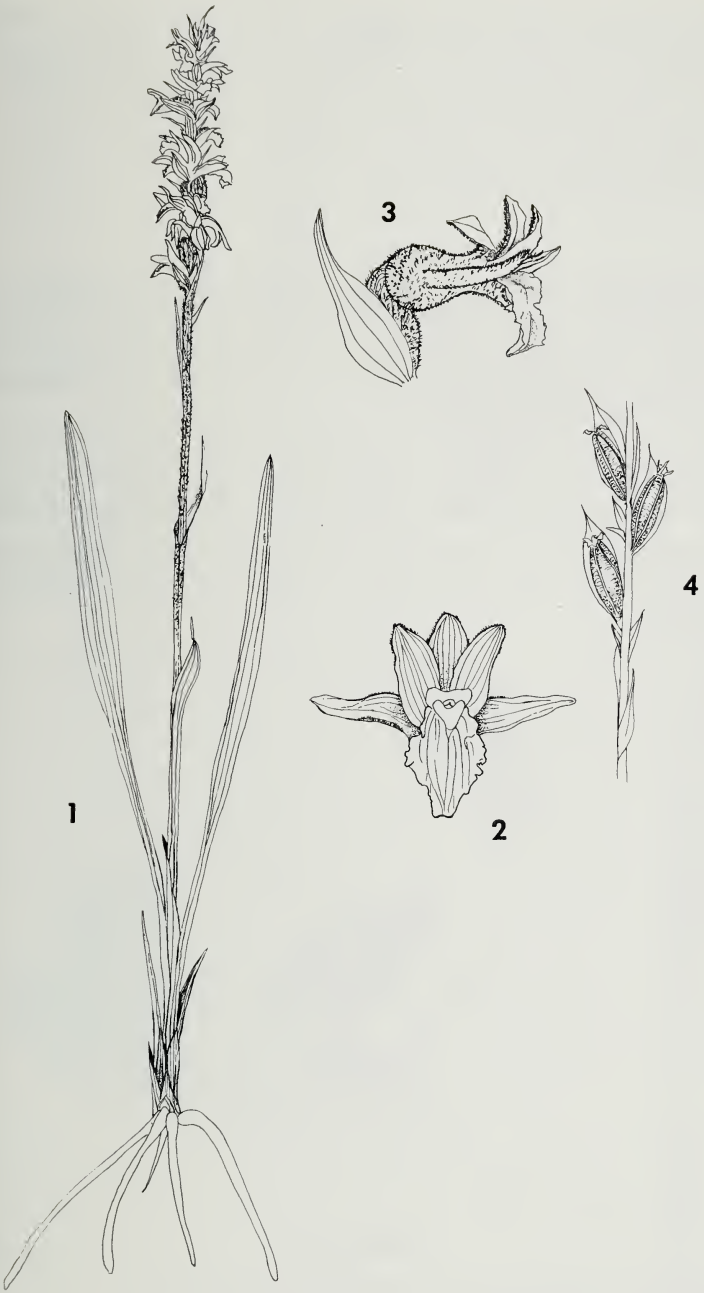


Plate No. 25

GOODYERA PUBESCENS (Willd.) R. Br.

Common names: Rattlesnake Plantain, Downy Rattlesnake Orchid.

Distribution: Northern and southeastern parts of the State.

Habitat: Woodlands and well-drained slopes.

Flowering from July through September.

Predominant flower colors: White.

The foliage of this little orchid is beautiful and probably more showy than the small white flowers. The leaves are 2 to 8.5 cm long and 1 to 3.5 cm wide. Three to six or eight of them occur in a basal rosette. They are green to blue-green with distinctive white veining and midrib.

The small white flowers are globe-shaped. The dorsal sepal is 4 to 5.5 mm long and up to 4 mm wide; it is strongly curved with a beak-like tip. Both sepals and petals are glandular-pubescent.

Petals and dorsal sepal form a hood over the lip. The lip ranges from 4 to 5 mm long and up to 3.5 mm wide. Oval capsules are borne erect.

Plate No. 26

1. Lower part of the plant. Drawing slightly reduced in size.
2. Upper part of the plant. Drawing slightly reduced in size.
3. Side view of the flower. Drawing 3 times natural size.
4. Front view of the flower. Drawing 3 times natural size.
5. Capsules. Drawing slightly reduced in size.

Plate No. 26

MALAXIS UNIFOLIA Michx.

Common names: Adder's Mouth Orchid; Green Adder's Mouth.

Distribution: Northern half of the State.

Habitat: Swamps; moist woods; shady ravines and wooded slopes.

Flowering from May through August.

Predominant flower color: Pale green.

It will, perhaps, require a close scrutiny of this plant to realize that it is indeed an orchid. The name "unifolia" means one leaf. The leaf is almost oval, 1 to 10 cm long and from 5.5 to 6.5 cm wide; its base clasps the stem from about half way down the plant.

The numerous pale green flowers are very small with a tiny bract below each one. The sepals range from 2 to 3.5 mm long and up to 1.5 mm wide. The small petals are thread-like.

The lip's shape is quite variable ranging from 2 to 5 mm long and 1 to 3 mm wide. Capsules are very small.

Plate No. 27

1. Entire plant. Drawing slightly less than natural size.
2. Front view of the flower. Drawing about 6 times natural size.
3. Side view of the flower. Drawing about 6 times natural size.
4. Capsules. Drawing slightly less than natural size.

Plate No. 27

KEY TO SPECIES OF LIPARIS

1. Flowers numerous (5 to 25) in a raceme; pale purple to madder purple. Lip at least 10 mm long or about as long as the petals. *Liparis lilifolia*. Page 70.

1. Flowers few (2 to 12) in a raceme; green to yellow. Lip less than 5 mm long or much shorter than the petals. *Liparis loeselii*. Page 72.

LIPARIS LILIFOLIA (L.) Rich.

Common names: Twayblade; Large Twayblade; Lily-leaved Twayblade.

Distribution: Scattered localities throughout the State.

Habitat: Floodplain woods; rich humus of woodlands.

Flowering from June through July.

Predominant flower colors: Greenish white; purple-brown to lilac.

The two, shiny, bright green and overlapping leaves of this orchid are borne near its stem's base. The leaves are oval, 5 to 18 cm long and 2 to 5.5 cm wide with a conspicuous midrib on their lower sides.

The flower scape is from 5 to 17 cm long and generally bears from a few to a dozen small flowers. Sepals are green-white, about 1 cm long and 2 to 2.5 mm wide. Margins of the dorsal sepal are rolled backward. The petals are very narrow, pendent, pale purple and slightly more than 1 cm long.

The lip is about 1 cm long and 7 to 10 mm wide; it is pale purple, and has an abrupt tooth at its apex. Capsules are ellipsoid and about 1.5 cm long. The corms have short, spongy roots.

Plate No. 28

1. Entire plant. Drawing slightly less than natural size.
2. Front view of the flower. Drawing about twice natural size.
3. Side view of the flower. Drawing about twice natural size.
4. Capsules. Drawing about natural size.

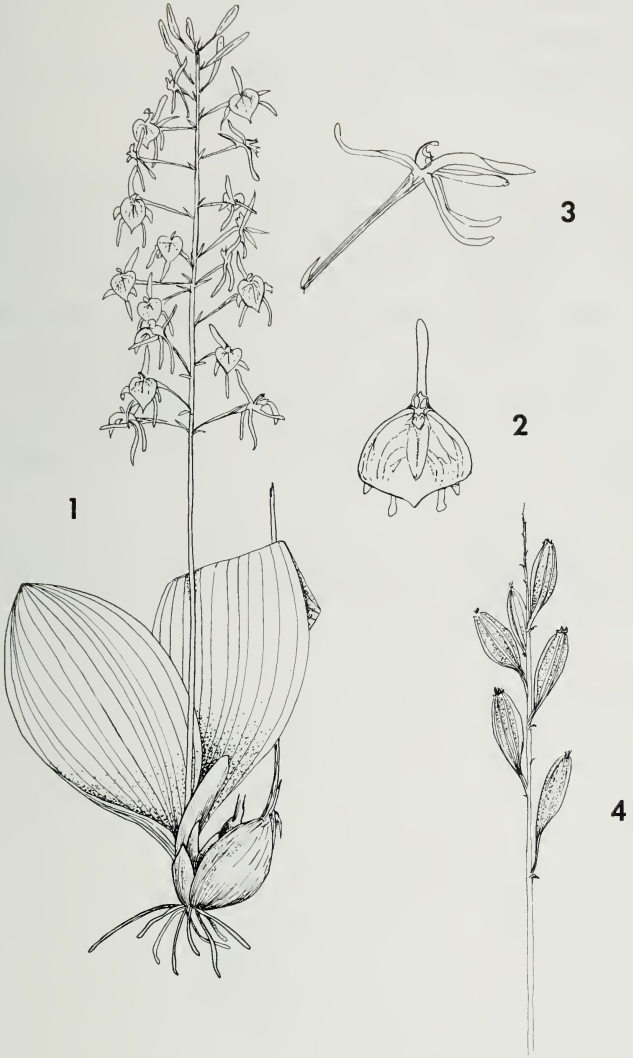


Plate No. 28

LIPARIS LOESELII (L.) Rich.

Common names: Loesel's Twayblade; Twayblade.

Distribution: Northern half of the State.

Habitat: Swamps; bogs; wet shores; wet grassy areas.

Flowering through June and July.

Predominant flower colors: Yellow green to pale green.

This twayblade, like *Liparis lilifolia*, has two sheathing leaves borne near the base of the stem. They are smooth, pale green to yellow green, bright and shiny. The entire plant is from 5 to 25 cm tall. Leaves range from 2.5 to 20 cm long and from 1 to 5.5 cm wide.

The yellow-green flowers are few in number (generally less than a dozen) and delicate in appearance because of the narrow sepals and thread-like petals. The bract below each flower is very small and bristle-like. The erect dorsal sepal arises from a broad base and is from 5.5 to 6 mm long and 1 to 2 mm wide. Dimensions of the lateral sepals vary slightly from those of the dorsal. The petals are 4 to 5 mm long.

The wavy-margined lip, with a toothed apex, is more conspicuous and is from 4 to 5 mm long and 3 to 3.5 mm wide. Capsules are ellipsoid and a little more than 1 cm long.

Plate No. 29

1. Entire plant. Drawing slightly less than natural size.
2. Front view of the flower. Drawing about twice natural size.
3. Side view of the flower. Drawing about twice natural size.

Plate No. 29

EPIPACTIS HELLEBORINE (L.) Crantz

Common names: Helleborine; Leafy Helleborine.

Distribution: Northeastern part of the State.

Habitat: Moist woodlands and grassy areas.

Flowering from late June through August.

Predominant flower colors: Green, shaded or marked with purple or red.

This is an introduced orchid from Europe. Its slender leafy stem is smooth below with short hairs above, and grows 10 to 120 cm tall. Leaves are variable in breadth (they are broadest at the middle of the stem) and their bases clasp the stem. The leaves become reduced in size, and form, in the flowering parts, a bract below each flower. Leaf blades range from 3.5 to 17 cm long and 1.5 to 9 cm wide.

The greenish flowers, tinged with purple, may be few to many in number and are borne on hairy ovaries. The curving sepals are 1 to 1.5 cm long and 4.5 to 5 mm wide, petals are much smaller, measuring 8.5 to 11 mm long and 4.5 to 5 mm wide.

The lower half of the otherwise greenish lip is dark purple, 8 to 10 mm long and 4.5 to 5.5 mm wide. Capsules are pendent and about 1 cm long. The stem arises from a rhizome bearing fibrous roots.

This orchid was first found in New York in 1879 and has spread into many areas since it was first observed and collected.

Plate No. 30

1. Lower part of the plant. Drawing much reduced in size.
2. Upper part of the plant. Drawing much reduced in size.
3. Front view of the flower. Drawing reduced in size.
4. Side view of the flower. Drawing reduced in size.

Plate No. 30

APLECTRUM HYEMALE (Muhl.) Torr.

Common names: Adam and Eve; Puttyroot.

Distribution: Scattered localities throughout the State.

Habitat: Rich humus in moist woodlands.

Flowering from May through June.

Predominant flower colors: White, pale green and pale yellow.

The entire lower part of the flower scape is enclosed with tubular sheaths. This flower scape is smooth, leafless and from 25 to 55 cm tall. Green-yellow or whitish flowers, borne on stout ovaries, may range from a few to a dozen or more. The sepals are from 1 to 1.5 cm long and 3 to 5 mm wide. The slightly smaller petals are from 1 to 1.2 cm long and 2.5 to 3.5 mm wide.

The three-lobed lip is slightly more than 1 cm long and 2.5 to 3.5 mm wide. The margins of the midlobe are uneven. The pendent capsules are from 1.5 to 2.5 cm long. The bract below each flower is very small.

A single basal leaf appears in autumn. It is dark green with whitish ribs and should not be confused with Cranefly Orchid leaves that are purplish beneath without whitish ribs. The leaf is about 10 to 15 cm long and 3.5 to 8 cm wide. It persists through the winter and by spring may be shredded and weatherworn. Rootstocks of these orchids are made up of a series of corms, connected by fibrous roots. From the latest corm a single leaf develops in autumn.

Plate No. 31

1. Lower part of the plant. Drawing reduced in size.
2. Upper part of the plant. Drawing reduced in size.
3. Front view of the flower. Drawing a little less than natural size.
4. Side view of the flower. Drawing a little less than natural size.
5. Capsules. Drawing a little less than natural size.

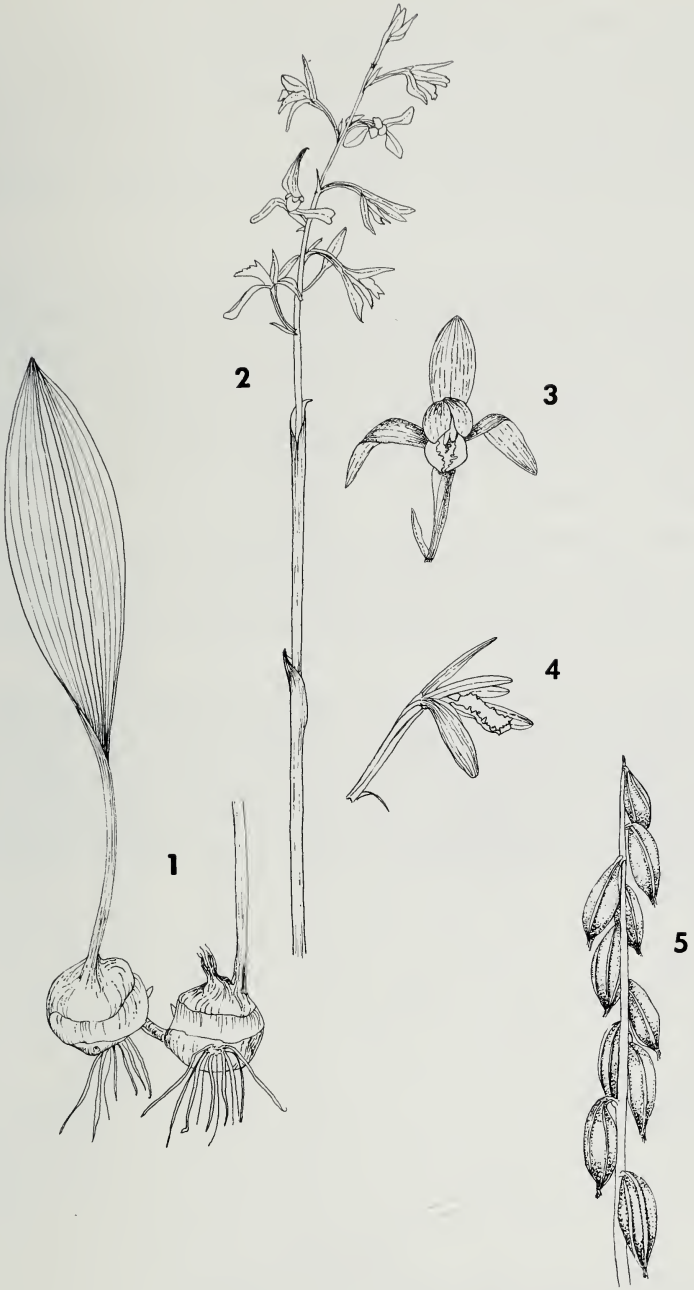


Plate No. 31

TIPULARIA DISCOLOR (Pursh) Nutt.

Common names: Cranefly Orchid; Cranefly.

Distribution: Southern part of the State.

Habitat: Rich humus in moist woodlands.

Flowering from June through August.

Predominant flower colors: Green-yellow, pale purple, rusty purple.

The very slender, erect, smooth stem may be from 10 cm to 70 cm tall. The stem is leafless and generally without bracts below the flowers; a long, brown-green, purplish sheath encloses its base. A single, cordate basal leaf, from 4.5 to 10 cm long and 3 to 7 cm wide, is produced in autumn; its petiole is slender, its blade dull green above and purplish below. This leaf may be confused with Puttyroot leaves, but the latter have whitish ribs and are green beneath, not purple.

The raceme is many flowered and the flowers are green-yellow to pale purple. Flowers are often pendent and borne on slender ovaries. The sepals are from 4.5 to 8 mm long and 1.5 to 3 mm wide. Petals are smaller than sepals, ranging from 4 to 7.5 mm long and 1 to 2 mm wide.

The lip is three lobed, 5 to 7.5 mm long and 2 to 3 mm wide with the mid-lobe the largest. A slender curved spur, arising from the base of the lip, is from 1 to 2.5 cm long. The oval capsule droops and is from 1 to 1.5 cm long. Rootstocks of Cranefly Orchids are made up of a series of corms with fibrous roots. A new corm forms in mid summer and in autumn, from this the single basal leaf develops.

Plate No. 32

1. Lower part of the plant. Drawing reduced in size.
2. Upper part of the plant. Drawing reduced in size.
3. Front view of the flower. Drawing 3 times natural size.
4. Side view of the flower. Drawing 3 times natual size.
5. Capsules. Drawing a little less than natural size.

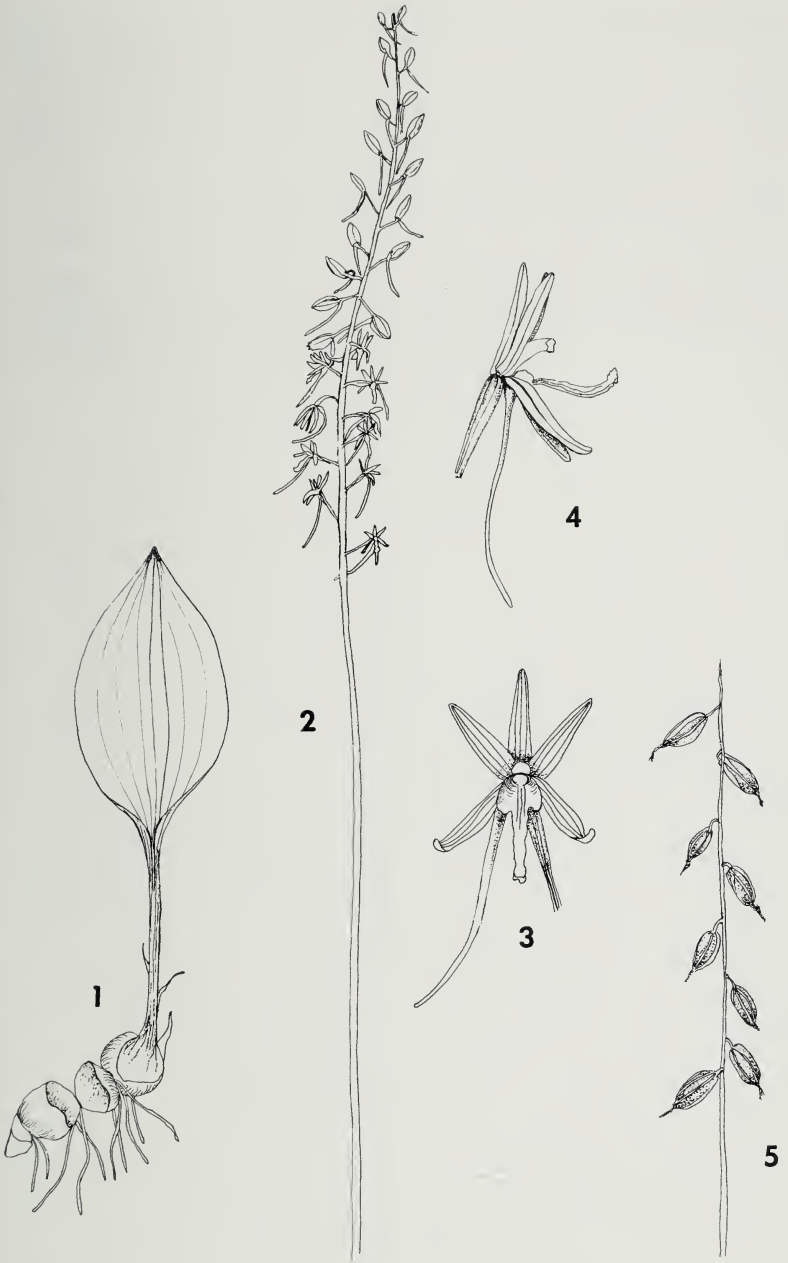


Plate No. 32

KEY TO SPECIES OF CORALLORHIZA

1. Lip three-lobed, sometimes unequally; white, spotted with red. Plants stout; blooming only in late summer. *Corallorhiza maculata.* Page 82.

1. Lip not three-lobed; white, spotted with red to purple. Plants stout or slender; blooming in spring or late summer.

   2. Lip with a wavy margin not notched at the apex; white, with red spots. Plants small and slender; blooming in late summer. *Corallorhiza odontorhiza.* Page 84.

   2. Lip with an entire margin notched at the apex; white, spotted with purple. Plants larger and stouter; blooming in spring. *Corallorhiza wisteriana.* Page 86.

CORALLORHIZA MACULATA Raf.

Common names: Coral Root; Spotted Coral Root; Large Coral Root.

Distribution: Northern half of the State.

Habitat: Moist, humus-rich woods.

Flowering from July through August.

Predominant flower colors: White with purple spots.

This is the largest and sturdiest of our Corallorhizas, but the stems may be stout or slender. Several tubular, clasping sheaths occur along the yellow-purple, smooth leafless stem. The plants are 15 to 80 cm tall.

The raceme bears several to a dozen or more small, irregularly arranged flowers on stout pedicels. The bract below each flower is very small. Sepals and petals are red-purple. The dorsal sepal is 6.5 to 9 mm long and 1.5 to 2 mm wide. The diverging lateral sepals are from 6 to 8.5 mm long and 1 to 2.5 mm wide. Petals are from 5 to 8 mm long and from 1.5 to 2.5 mm wide.

The three lobes of the lip are noticeably unequal in size. The lip is white with purple spots, 4.5 to 8 mm long and 4 to 5 mm wide. Oval capsules are pendent and 1.5 to 3 cm long.

The stem is thickened just above its coralloid rhizomes and the plant is saprophytic.

Plate No. 33

1. Upper part of the plant. Drawing somewhat reduced in size.
2. Lower part of the plant. Drawing somewhat reduced in size.
3. Front view of the flower. Drawing about twice natural size.
4. Side view of the flower. Drawing about twice natural size.
5. Capsules. Drawing about natural size.

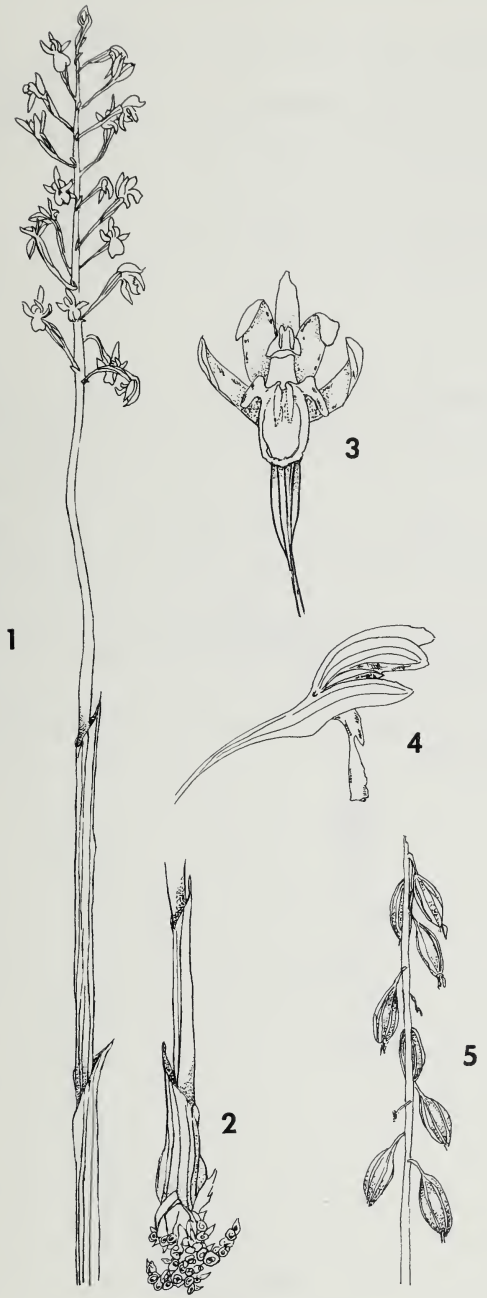


Plate No. 33

CORALLORHIZA ODONTORHIZA (Willd.) Nutt.

Common names: Late Coral Root; Coral Root; Fall Coral Root; Small Coral Root.

Distribution: Probably statewide in suitable habitats.

Habitat: Rich humus in woods; sometimes in dry to moist sandy soil.

Flowering from August through October.

Predominant flower colors: White, purple or with purple to reddish spots.

These plants nearly always have a slender, smooth, leafless and pale brown stem 10 to 40 cm tall. The tubular, sheathing scales overlap and often cover the stem up to the flowers.

There may be few to many small, purple-green flowers. The dorsal sepal is from 3 to 5 mm long and 1 to 1.5 mm wide. The incurved, lateral sepals are from 2.5 to 5 mm long and about 1 mm wide. The petals are from 3.5 to 4 mm long and 1.5 to 2 mm wide.

The recurved lip is white, spotted with red-purple, and is 3.5 to 4.5 mm long and 3.5 to 5 mm wide. Capsules are oval, pendent and from 6.5 to 8 mm long.

This is a saprophytic orchid with a thickened lower stem and coralloid rhizomes.

Plate No. 34

1. Entire plant. Drawing about natural size.
2. Front view of the flower. Drawing about 3 times natural size.
3. Side view of the flower. Drawing about 3 times natural size.
4. Capsules. Drawing a little less than natural size.

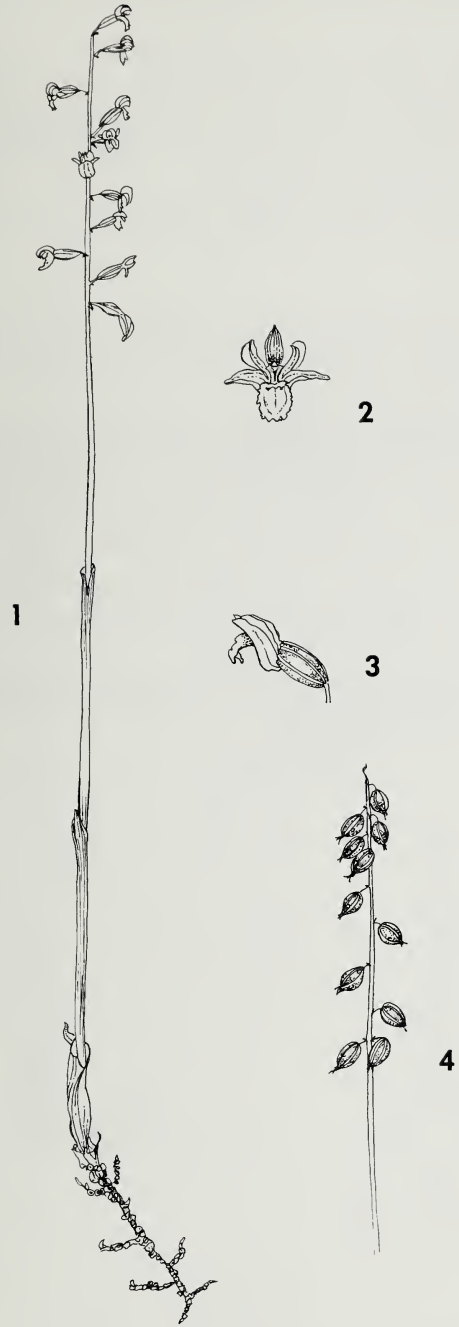


Plate No. 34

CORALLORHIZA WISTERIANA Conrad

Common names: Wister's Coral Root; Spring Coral Root.

Distribution: Southern half of the State.

Habitat: Rich humus in shady woods; swampy woods.

Flowering from April through May.

Predominant flower colors: White, green-yellow, purple-brown.

These are plants with smooth, leafless, brownish stems; they are slender to stout and from 10 to 40 cm tall. Scale-like, tubular sheaths occur along the stem.

Flowers arranged in the raceme are generally few in number. Sepals and petals are green-yellow with a tint of purple. The dorsal sepal is from 5 to 10 mm long and 1.5 to 2 mm wide. Lateral sepals are smaller and may be from 5 to 9 mm long and 1 to 2 mm wide. Petals are 5 to 7.5 mm long and 2 to 2.5 mm wide.

The lip is recurved, oval, white and spotted with purple. It ranges from 5 to 7 mm long and 4 to 5 mm wide. The oval, pendent capsules are from 8 to 10 mm long.

Rhizomes are coralloid with a few sharp, tooth-like projections and the plants are saprophytic.

Plate No. 35

1. Entire plant. Drawing about natural size.
2. Front view of the flower. Drawing about twice natural size.
3. Side view of the flower. Drawing about twice natural size.
4. Capsules. Drawing about natural size.

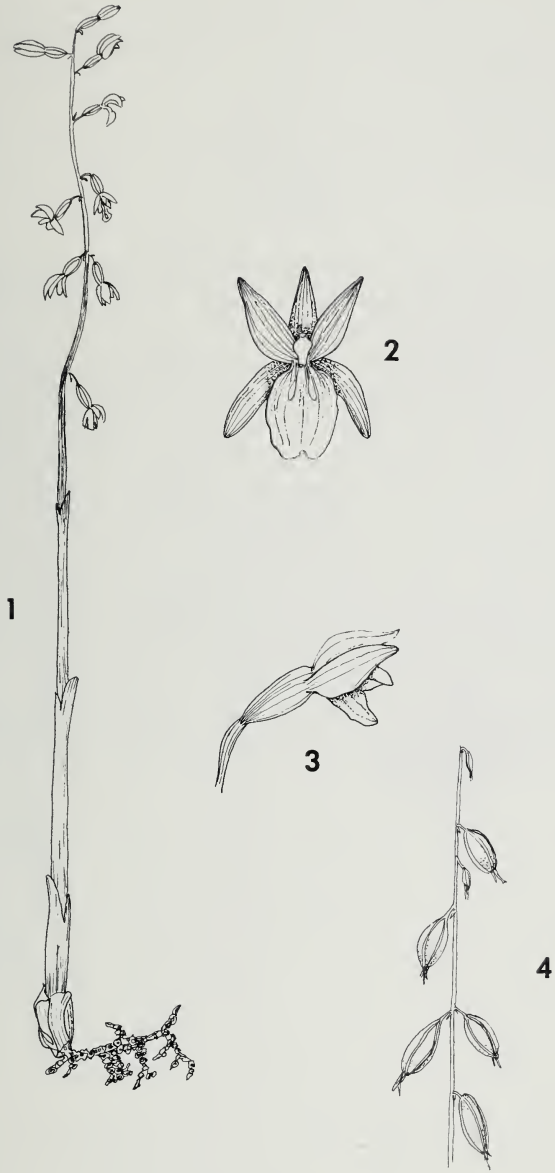


Plate No. 35

HEXALECTRIS SPICATA (Walt.) Barnh.

Common name: Crested Coral Root.

Distribution: Southern part of the State.

Habitat: Rocky, wooded slopes; limestone outcrops; humus of wooded areas.

Flowering from July through August.

Predominant flower colors: Yellow-white with brown-purple lines.

This orchid may grow from 15 to 80 cm tall, with smooth, stout to slender, brown-purple stems that are leafless but bear scale-like bracts as a sheath.

The flowers may be few or a dozen in number. They are loosely arranged, scattered along the axis and borne on stout pedicels. The bract, below each flower, is triangular in shape. Sepals and petals are yellowish with brown-purple lines or veins. Petals are from 1.5 to 2 cm long and 4 to 9 mm wide. The dorsal sepal may be from 2 to 2.5 cm long and 5 to 9 mm wide, and the lateral sepals are from 1.5 to 2 cm long and 5 to 8 mm wide.

The yellow-white lip has three shallow lobes with purple veins and may be from 1.5 to 1.8 cm long and up to 1.5 cm wide. The strongly ribbed, pendent capsules are from 2 to 2.5 cm long. Rhizomes are coralloid and the plant is saprophytic.

This orchid was first collected in Illinois by the author on July 13, 1949 near Prairie du Rocher in Randolph County.

Plate No. 36

1. Lower part of the plant. Drawing a little less than natural size.
2. Upper part of the plant. Drawing a little less than natural size.
3. Side view of the flower. Drawing about natural size.
4. Front view of the flower. Drawing about natural size.

Plate No. 36

Cypripedium acaule

Valdemar Schwarz

Cypripedium reginae

Valdemar Schwarz

Cypripedium reginae

Valdemar Schwarz

Cypripedium parviflorum
F. G. Irwin

Cypripedium parviflorum
F. G. Irwin

Cypripedium candidum

F. G. Irwin

Orchis spectabilis

F. G. Irwin

Orchis spectabilis

F. G. Irwin

Habenaria bracteata

F. G. Irwin

Habenaria flava

Frederick Case Jr.

Habenaria clavellata

Frederick Case Jr.

Habenaria hookeri

Frederick Case Jr.

Habenaria ciliaris

Valdemar Schwarz

Habenaria lacera

Frederick Case Jr.

Habenaria lacera

Frederick Case Jr.

Habenaria leucophaea

Valdemar Schwarz

Habenaria leucophaea

Valdemar Schwarz

Habenaria psycodes

Frederick Case Jr.

Habenaria psycodes

Frederick Case Jr.

Calopogon pulchellus

F. G. Irwin

Triphora trianthophora

Frederick Case Jr.

Pogonia ophioglossoides
F. G. Irwin

Pogonia ophioglossoides
Valdemar Schwarz

Spiranthes gracilis

Frederick Case Jr.

Spiranthes lucida

Valdemar Schi

Spiranthes lucida

Frederick Case Jr.

Spiranthes cernua

Virginia S. Eifert

Goodyera pubescens

Frederick Ca

Goodyera pubescens

Valdemar Schwarz

Malaxis unifolia

Frederick Case Jr.

Liparis loeselii

Valdemar Sch

Liparis lilifolia

F. G. Irwin

Epipactis helleborine

Frederick Case Jr.

Aplectrum hyemale

F. G. Irwin

Aplectrum hyemale

Frederick Case Jr.

Tipularia discolor

Frederick Cas

Tipularia discolor

Frederick Case Jr.

Corallorhiza maculata

Dorothy Wade

Corallorhiza maculata

Valdemar Schwarz

Corallorhiza odontorhiza

Valdemar Schwarz

Hexalectris spicata

Charles Hodge

GLOSSARY

Acuminate.	Tapering to a point.
Acute.	Ending in a point.
Adnate.	Attached entirely or partially.
Anther.	That part of a stamen which holds the pollen.
Apex.	The tip of a part or organ.
Apiculus.	A short, pointed tip.
Axil.	The upper angle of leaf or branch with the stem.
Axis.	That portion of a plant from which a series of leaves or flowers arise.
Blade.	The expanded part of a leaf or a floral part.
Bog.	Wet areas having highly organic soil and acid water.
Bract.	Modified, leaf-like structure below a flower or below a cluster of flowers.
Calyx.	The outer members of the two series (sepals and petals) of floral parts.
Capsule.	Dry, dehiscent fruit made up of two or more carpels.
Carpel.	A single pistil or one member of a compound pistil.
Cauline.	Inserted or borne on the stem.
Ciliate.	Fringed along the margin (edge).
Clavate.	Club shaped.
Column.	Formed by union of stamens and pistils in orchids.
Coralline.	With the appearance of coral.
Coralloid.	Branched and brittle like some corals.
Cordate.	Heart shaped.
Corm.	Enlarged basal, bulb-like part of a stem.
Corolla.	The inner members of the two series (sepals and petals) of floral parts.
Crested.	Elevated parts or appendages with fringes.
Crisped.	Folded and somewhat wavy.
Cuspidate.	Tipped with a sharp tooth or point.
Disc.	The upper surface of the lip in an orchid flower.
Ellipsoid.	A solid body with an elliptic shape.
Elliptic.	Oblong with the ends rounded.
Epiphyte.	A plant growing on or attached to some other plant but not parasitic.
Fimbriate.	Fringed.
Fungi.	The plural of fungus.
Fungus.	Parasitic or saprophytic lower plant with no chlorophyll.
Fused.	United or joined together.
Genus.	A group of plants, naturally related, and made up of distinct species and kinds.
Genera.	Plural of genus.
Glandular.	Bearing glands or gland-like appendages.
Glabrous.	Smooth to touch; without hairs.
Globose.	Nearly round; spherical.

Habitat. The place in which a plant grows; such as woods, swamps, bogs, etc.

Haustoria. Absorbing organs of parasitic plants.

Herbaria. Plural of herbarium.

Herbarium. A collection of pressed, dried, mounted and identified plants systematically arranged.

Hood. A partial covering. As used in the text it refers to sepals, petals, or both.

Humus. Decaying or decomposing organic matter in soil.

Indigenous. Native in a state or area and not introduced; not brought in from another state or country.

Inflorescence. That part of a plant bearing flowers.

Inferior. Used to describe the ovary when other floral parts are inserted upon it.

Irregular. Applied to flowers which can be bisected into similar halves along one plane only (flower that can be divided vertically into similar halves through two or more planes are regular).

Incised. More or less sharply and deeply cut; often irregularly.

Labellum. A modified petal; the lip of an orchid flower.

Lanceolate. Longer than wide and tapering at both ends.

Lip. In an orchid flower a modified petal, unlike the other two petals in color, size and shape.

Lobe. Part of a leaf, sepal or petal representing a division to about the middle.

Maculate. Spotted or marked with various colors.

Marsh. An area generally covered with grasses and sedges and with varying wetness depending on rainfall and season.

Node. The joint at which leaves are inserted on a stem.

Obtuse. Round or blunt at the end.

Oval. Broadly elliptic or oblong with the ends rounded.

Ovary. Basal portion of the pistil; the immature fruit.

Parasite. A plant which grows on and takes its nourishment for growth from another plant. (See epiphyte)

Pedicel. The stalk supporting one flower.

Peduncle. The stalk carrying the flowers.

Petal. A single, generally colored, inner part of a floral group.

Petiole. The stalk which supports a leaf.

Pendent. Hanging downward.

Perfect. Having both stamens and carpels (flowers not perfect have either stamens or carpels).

Perianth. The calyx and corolla.

Pollinia. Waxy pollen or masses of waxy pollen.

Pseudobulb. Thickened, swollen stems especially in orchids.

Pubescent. Having soft, short or long hairs.

Raceme.	An arrangement of flowers on a more or less elongated axis or stalk.
Reflexed.	Bent downward or backward.
Ribbed.	Veins of a leaf where they are prominent.
Reticulate.	Having a net-like appearance.
Rootstock.	Underground stem usually rooting at the nodes.
Rosette.	A cluster of parts arranged in a circular pattern.
Scape.	A flowering stalk, generally without leaves, arising from the ground.
Sepal.	A single, generally green, outer part of a floral group.
Sessile.	Without a stalk, pedicel or peduncle.
Sheath.	Lower part of a leaf often clasping and tubular.
Smooth.	In the text used to mean without hairs; not rough to touch.
Spatula-shaped.	Dilated upward to a round apex.
Spike.	A kind of inflorescence in which the flowers are sessile or nearly so along an axis or stalk.
Spur.	A hollow, tubular or sac-like extension of the lip (in an orchid flower).
Stigma.	That part of the pistil which receives the pollen.
Stolon.	A slender, modified stem along or in the ground and rooting at its nodes.
Stamen.	The pollen bearing organ of a flower.
Succulent.	Soft in texture and generally juicy.
Taxonomy.	The classification of plants and animals in a systematic order.
Taxonomic.	Pertaining to taxonomy.
Terrestrial.	Growing in or on soil which furnishes support and nourishment.
Truncate.	With an abrupt end as if cut off.
Tuber.	Enlarged underground stem generally swollen and bearing buds.
Vernal.	Appearing or growing during the spring.

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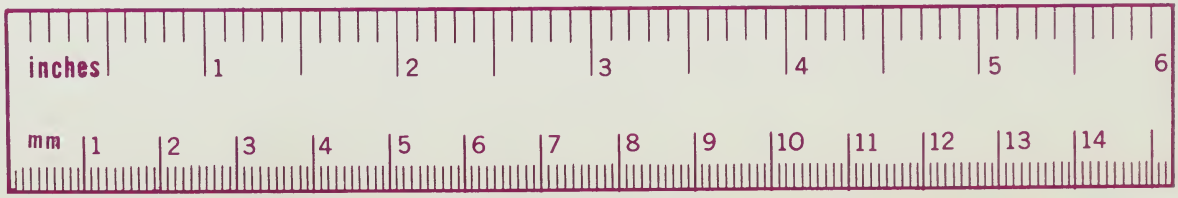
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